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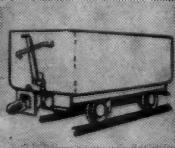


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The Mining Journal

London, March 13, 1959

In this issue . . .

The Significance of Nyasaland	279
Possible New Tin Fields in Malaya	280
Indonesian Mining Bills	281
Effects of Radiation on Anthracite	281
Developments in the Solomons During 1958	282
Electrolytic Production of Hydrogen and Oxygen	283
The World's Largest Lateritic Iron Ore Deposit	284
Raising Vertical and Inclined Shafts	286
Technical Briefs	287
Mining Miscellany	288
Metals and Minerals	289
London Metal and Ore Prices	290
Mining Finance	291
Rand and Orange Free State Returns for February	292
Company Meetings	293
Coming Events	296
West African Gold Production	298
South African and Rhodesian Coal Output	298

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The Significance of Nyasaland

NOBODY in the Central African Federation has yet referred to the recent disturbances as "a little local difficulty". But, if Mr. Macmillan's classic phrase has not been borrowed, its substance has. The impression that the Federation leaders wish to give is that what is happening is an internal affair best settled by themselves, within their own borders, and with a minimum interference from Whitehall. This is a case that can be argued. But Sir Roy Welensky has himself claimed that the disturbances were plotted in Accra at last year's convention and were fomented by Russia. This alone, is tantamount to admitting that the problems of the Central African Federation are only a part of the African problem as a whole.

Africa today is the world's battleground. In Europe, Communism has been contained on the borders of the present Iron Curtain; in America, north and south, the United States exerts its influence by foreign aid; in Asia there is stalemate; only in Africa and the Middle East is the battle on. The battle is for nothing less than control of the entire continent. Will Africa go Communist? Will it—for want of a better word—stay free? What needs to be admitted at the outset is that if Africa does go into the Communist camp then the Free World will hardly stand up. Asia will be cut off from Europe; Europe will appear to the United States as an indefensible outpost; and the United States will withdraw into the Western Hemisphere, looking, if it looks outward at all, to Australia and New Zealand and the Eastern extremities of Asia.

Difficulties now arise in Nyasaland; but yesterday they were in the Congo and Algeria, and the day before Kenya; tomorrow—who knows—perhaps Nigeria. Oddly enough, the two quietest areas are South Africa (where the freedom of the African is circumscribed) and Portuguese territory (where African political development has scarcely begun), yet it is here, according to political theorists, that the troubles ought to arise first.

The Western World must consider these problems together. It is as important to have a common policy on Africa as it is to have one on Berlin. There are two stumbling blocks to this. One is the differing approaches of the European countries which still have political or constitutional power in Africa—Britain, France and Belgium. (Portugal, which appears to lack both the power or the intent to promote independent African politics may for this purpose be omitted.) Now all three countries have expressed their purpose of creating self-governing communities, and though they are going about it (rightly) in very different ways, it ought to be possible for them to harmonize their views. If progress in all territories could be kept somehow in step it would prevent an advance in one becoming the excuse for an outrage in another.

Secondly, the United States preserves an aloofness on the pretext that it does not want to involve itself with "colonial

powers". The United States must not be mealy-mouthed about this. It is up to the neck with the "colonial powers". Until it has an inter-continental ballistic missile its very safety depends on them. Furthermore, it is a substantial investor in the Rhodesias and the Congo and it must help to share the burdens as well as pocket the profits.

But all this only puts the Central African troubles in setting. What can be done on the immediate issue? Perhaps four things.

First, undisputedly, order must be restored with a minimum of bloodshed. Secondly, temperatures all round have to be lowered. The real danger now is that whites in the Federation and the British Labour Party (which may possibly be in power in less than a year) are falling further apart with every speech that is made. Somehow this dangerous cleavage of opinion between Salisbury and London must be stopped from widening. Perhaps nothing but silence can do it. But here in London we must remember that it was less than six months ago that the Federation voted solidly for a party standing for racial partnership and threw out others standing for apartheid, that Africans can go to a common university, that there is common voting and that to put it bluntly Rhodesians are not "Nats". It is unfortunate that these facts are not sufficiently appreciated by some of those extremists in this country whose partisanship is so often based on sentiment rather than any first-hand knowledge of African problems.

Thirdly, there must be better consultation between London and Salisbury. Ministers in London have shown themselves in the House of Commons to be not in touch with things as they should be. Lord Perth has been coming and going in a most unconvincing way. The standing-by of troops in Kenya when Sir Roy Welensky plainly states they will not be needed is another example of muddle and uncertainty coming to the surface. There is something to be said for the London view that troops from Kenya would restore order in Nyasaland without political complications; there is something to be said for Sir Roy's view that a state must maintain order itself or cease to be a state; there is nothing to be said for not settling this difference in advance or trying to settle it in public. It is tragic that the only apparent link at the moment is Mr. Stonehouse who appears to be a conscientious man possessed of such political naivety as to be dangerous in the circumstances. What is the use of having a Comet that can get there in a few hours if advantage is not taken of it?

Fourthly, there is something to be said in favour of the copper companies speaking out at this time. For one thing the size of their stake would alone justify it. For another they could at least tell the politicians that such partnership as has come has largely come from them. They have the experience. African advancement, modest though it is, is a fact. The copper companies stand for order, the avoidance of extreme positions, the lowering of temperatures, getting on with the job instead of striking attitudes; these are the very things that are wanted in the present crisis.

This perhaps is modest advice, but it will do no harm and may do some good. But the advice will be useless unless there is a realization of what we said at the outset—that this is now an international problem of world-shaking significance. In London and in Africa sectional advantages will have to be sacrificed to the keeping of Africa as a whole out of the Communist camp. And the whole time-scale of constitutional planning is now out of date. We can no longer say that in five years Africans will be trained to undertake so much, in ten years so much more; for the simple reason that we are no longer in sole control of events. As far as Russia is concerned the most stupid thing to do is to ignore her.

POSSIBLE NEW TIN FIELDS IN MALAYA

"There is a possibility of economic mineral deposits occurring at depth in certain limited parts of the area," says Dr. J. B. Alexander, director of geological survey, Federation of Malaya, in his interpretative summary of the report of Dr. W. B. Agocs, chief geologist of the airborne magnetometer and scintillator counter survey over six separate areas of the Federation in late 1956 and early 1957. The report on Area 1, covering parts of Perak, Selangor and Negri Sembilan, has just been published as *Economic Bulletin 1.1*, by Geological Survey Headquarters, Ipoh, Perak, at M\$5.00.

In addition to Dr. Agocs's technical report and Dr. Alexander's interpretative summary, the *Bulletin* contains a chapter by Mr. J. R. Paton, principal geologist of the geological survey, Federation of Malaya, describing the geology and economic geology of the area, and two combination maps showing the contours of magnetic and radioactive levels recorded.

The survey was made by a D.C.3 aircraft of Spartan Air Services Ltd., of Ottawa, under a contract awarded to them by the Canadian Commercial Corp. By Colombo Plan arrangements, the Canadian Government subscribed Canadian \$200,000 towards the cost, and the Federation of Malaya Government undertook to provide the balance up to the equivalent of a further Canadian \$150,000. The equipment installed in the aircraft included a continuous recording Gulf Research and Development Co. flux gate magnetometer, a Measurement Engineering Laboratories Model 1903 K dual-head continuous recording scintillation counter, and auxiliary positioning equipment, all furnished by Canadian Aero Service Ltd., also of Ottawa, which concern also supplied the technical staff.

For the purposes of the *Bulletin*, Area 1 is divided into two sub areas: Area 1 (a) comprises a long strip of 1,428 sq. miles in South Perak and North Selangor covering part of the coastal plain and the undulating foothills to the east in South Perak extending into North Selangor. This area, in which practically all the tin ore deposits being worked are alluvial, and in which some gold is recovered during the mining of the tin and tungsten mineral deposits, includes the extreme southern end and extension of the Kinta Valley, the richest known tin field in the world.

Dr. Alexander does not consider that any new discovery of major economic importance will result from the survey of this sub area. He does, however, refer to some strong magnetic lows which it is intended to examine in greater detail. One such anomaly in the Trans-Perak area at Permatang Bertram has been investigated with limited equipment without determining the cause of the anomaly. Further examination will require considerable expenditure and it is unlikely that the project will appeal to the mining industry. A postulated fault indicated to the north of Changkat Besout, is to be examined by a geological field investigation team, as, if the fault is present, it is possible that the zone is mineralized, and non-ferrous deposits may be found.

The area of a radioactivity anomaly 5.6 water background has been visited but no obvious cause could be determined. It is not thought that a deposit of radioactive minerals exists here, but rather that anomalies in the region are caused by concentrations of clay in the alluvium. Some minor highs along certain rivers are to be investigated on the ground although it is not expected that they will prove to be of any economic significance. The examination of two strong magnetic lows in proximity to the Batang Berjuntai alluvial tin field will involve considerable expense, but Dr. Alexander considers that at least one of them may be attractive to private enterprise. The causes of the anomalies lie at a depth between 500 and 1,000 ft.

Area 1 (b)—South Selangor and West Negri Sembilan—includes the Kuala Langat Forest Reserve, where a good dredging area for tin ore is known to exist, and the Tanjong Duablas Malay Reserve and Extension, also of much recent interest for prospecting. Iron ore is known to occur in the area between Sepang and Lukut, but is believed to be of low grade.

It is significant that a strong magnetic low occurs west of Bukit Cheting in the Tanjong Duablas Malay Reserve Extension, adjoining the Kuala Langat Forest Reserve, and another between Kajang and Puching, north of Bukit Bisa and south of the Sungai Besi-Serdang tin field. The causes are probably rises in the granite basement surface to depths not exceeding 500 to 1,000 ft. Both are considered to merit further investigation. Radioactivity variations in the area are relatively minor and it is not anticipated that they will prove to be of any economic mineral significance.

Dr. Alexander concludes that the chief and more immediate interest lies in the possibility of an alluvial tin field in the Tanjong Duablas Malay Reserve and Extension and in the Kuala Langat Forest Reserve. He stresses that his interpretative summary must not be considered as a full prospecting report, since no special note has been taken of possible superficial deposits, and that the survey deals predominantly with the distribution of basement rocks.

In the Federation of Malaya, where tin ore is of predominant importance, the contacts between the various granite masses and the sedimentary rocks are of particular interest. As Mr. Paton points out in his introduction to the geology of the country, the primary tin lodes are invariably associated with such contacts. He opines that the reason for the abundance of tin ore on the west side of the Main Range is because of the predominance of limestone, a good host to mineralizing solutions, on that side, whilst the relative rarity on the east side is due to the rocks abutting on to the granite being mainly conglomerate, quartzite and shales with only rare calcareous horizons. However, he does not consider this to be fully satisfying, since it cannot explain what happened to the tin if originally present in the granite masses on the east side.

Five other bulletins to be published will deal each with one of the five other areas comprised in the 15,686 sq. miles over which 33,389 linear miles of aeromagnetic and radioactivity traverse were flown between November 19, 1956, and May 22, 1957. Further bulletins will cover respectively the theory of magnetic and radioactivity measurements; ground investigation of magnetic anomalies; and ground investigation of radioactive anomalies.

INDONESIAN MINING BILLS

On February 2, news was received that the Indonesian Government had introduced a Bill to revoke mining rights given by the Dutch Government which are not now being exploited. The Bill, expected mainly to affect mining licences held by Dutch concerns, became law on February 11, when it was passed with some amendments. The provisions of the Bill will be applied only to those concessions issued by the former colonial government.

Introducing the Bill in Parliament, Mr. Ingkiriwang, Minister of Industry, said that it would not affect mining rights granted by the Indonesian Government or those given by the Dutch Administration which were still being exploited. Although he gave no details of what would happen to the mining properties when the licences were revoked, he stressed that the new Bill would make it possible to bring the idle mines to production.

The Indonesian Government intends to conduct a survey of the properties before plans can be made for their re-

exploitation. The Ministry of Industry announces that 2,400 mining licences are held by foreigners. Most of the 1,349 in the hands of Dutch *entrepreneurs* have been idle since the anti-Dutch campaign of 1957. At the same time, however, early in February, Indonesian news sources quoted Mr. Ingkiriwang as saying that the government had no objection to attracting foreign technicians and research workers to fill the country's existing need for such personnel.

A government survey team will examine the mineral deposits of Riau Province. During the colonial era, a search in the area showed the islands of Singkep, Lingga, Selajar and Kundur to be rich in tin ore with Bintan holding deposits of bauxite. Furthermore, at about the same time, the Indonesians were reported as having granted the Sari Bumi Co. a licence to exploit deposits of manganese ore. Manganese mining is also to be carried on for the first time in the Djember district of south-east Java by N. V. Pantjasila, a national concern. Indeed, the plant was officially opened on December 1, 1958, and monthly output is expected to reach 10,000 tons for a profit over the same period of Rp. 500,000.

A diamond mine was opened in October last year near the Bohot rivulet in Central Borneo. Some 2,000 workers are employed and estimated output since the commencement of operations is said to be worth Rp. 2,000,000. In East Borneo coal output has fallen considerably during the last two years owing to financial difficulties. Some coal-producing enterprises have closed down and foreign capital is being sought to take over the organization of the N. V. Sebuku mine.

Latest news from Djakarta is that on March 7 the Indonesian Government introduced in Parliament two Bills, one controlling mining and the other drilling for petroleum. Under the Mining Bill, the State may grant persons of Indonesian nationality mining rights. The State will maintain a majority share, however, in any company formed by Indonesian nationals.

EFFECTS OF RADIATION ON ANTHRACITE

Completion of the first phase in a pioneering experiment by the U.S. Bureau of Mines to find out if atomic treatment can open the door to fuller use of America's considerable anthracite reserves has been announced by the Department of the Interior.

The initial step in this new line of research was taken recently when tiny samples of hard coal were exposed to high doses of radiation in the Curtis-Wright nuclear research and test reactor, Pennsylvania. Curtis-Wright performed the work through a government contract under which it also trained Bureau of Mines researchers in certain nuclear techniques.

The immediate purpose of the experiment is to gain fundamental knowledge of the effects radiation may have on the physical and chemical properties of anthracite.

Reserves of anthracite in Pennsylvania are estimated at nearly 15 billion tons and represent one of the largest potential energy sources in the United States. In recent years the industry has encountered steadily rising costs, not only in mining the steeply pitching anthracite beds, but in pumping out water that filters into the deep mines.

Although U.S. Bureau of Mines mining research promises lower costs and higher efficiency in extracting coal, and a State-Federal mine-drainage programme is making progress against the water problem, a broader use of anthracite is essential if the industry is to prosper and this valuable resource is to remain accessible to future generations. The coal specimens irradiated are being analysed and tested and reports on preliminary results expected soon.

THIS year has seen more geological activity than in any year hitherto. Outside organizations have supported the survey in the field: two private companies have financed, for the second year, a major research project which has led to economic discoveries; two other organizations have followed up the work of the Geological Survey Department and concluded successfully the detailed exploration of two mineral deposits of economic importance; and the results of research on Choiseul¹ have been received from Sydney University. Four geologists have been operating for most of the year, another for six months, five others and a geophysicist, all visitors, were operating for shorter periods on special undertakings. In addition, the Royal Navy Survey Vessel, H.M.S. *Cook*, spent about four months in the area on hydrographic, bathymetric, and magnetometric surveys, which will be of value.

Developments in

For the first time since the establishment of the survey² all personnel were engaged during the year in areas of economic interest.

The Solomons

The following are the immediate results of importance from this economic work:

Bellona phosphate reserves were shown to be substantial, though not high grade.

Hanesavo manganese deposit was shown to be mineable. Chrysotile asbestos bearing areas were found and mapped on San Jorge.

Further mineral-bearing areas were found at Betilonga, in the Guadalcanal mountains.

Four areas have been made the subject of prospecting licences, and one of these is under further application for a mining lease.

The department's investigations on Bellona were completed in November, 1957, with the sampling of the phosphates of iron and alumina which constitute the bulk of the material in the fertile central valley. The Australian Bureau of Mineral Resources had recently been granted a prospecting licence covering Bellona, and arranged examination and assay of these samples. Three Bureau geologists³ and a party of fourteen arrived on April 21; two geologists undertook the final boring programme on Bellona and one made a reconnaissance of smaller islands in the east of the Protectorate. The team left the Protectorate on May 27. Subsequently, it was announced⁴ that there were phosphate reserves of the order of 8,000,000 tons on Bellona.

Attention was again given to Hanesavo Island manganese deposit. Since the survey's reconnaissance in 1951, successive prospecting licence holders had lacked the courage to do the required further development work. One survey geologist⁵ and party spent six weeks in January and February trenching and tunnelling, confirming the presence of more manganese. Another geologist⁶ and party continued the work for another fortnight in March and discovered a sulphide body, its highest point being 10 ft. below the surface: there had been no outcrops or indications of it on the surface (see Report No. 6). In April, a prospecting licence was issued,⁷ so the department did not

carry on with sampling: this was done by a visiting geologist⁸ between May 19 and June 6; as well as sampling the available trenches, he did further trenching and pitting on this occasion. Also in June, a Royal Navy shore party made a hydrographic survey of Hanesavo harbour—which appears suitable for ocean-going ships. Subsequently, in September, news was received that the assays were favourable, and a mining lease was applied for.⁹

The Royal Navy Hydrographic Survey Vessel, H.M.S. *Cook*, arrived on March 31, and remained in the region until June 14. Funds had been arranged¹⁰ to permit Mr. Fred Gray, geophysicist from the Imperial College of Science and Technology, to fly to New Zealand to join and equip the ship with a towed proton magnetometer. Thus as well as bathymetric data, the ship was able to simultaneously record magnetic data during travels in the Solomons, New Guinea, and Fiji waters. The work is to be the subject of a separate research paper by Gray at a later date.

In addition to the ship-towed unit, Gray's newly developed lightweight portable proton resonance magnetometer (weight, 22 lb. all up) was made available to the department. Grids were laid out on Hanesavo manganese deposit and on eastern San Jorge's laterite-capped ultrabasic hills. The ease of operation and the surprising consistency of the results indicate that future magnetic surveys will be considerably expedited by the use of this instrument in

rough country such as the Solomons. Instead of fifteen stations an hour by ordinary magnetometer, it proved possible to do sixty stations an hour with the new instru-

During 1958

ment—using Solomon Islander staff after only an hour's instruction.

The eastern end of San Jorge has received more detailed attention this year than has any other part of the Protectorate. On one occasion five geologists, one geophysicist, and all other field personnel were concentrated there. Chrysotile-bearing areas and nickeliferous laterites have been mapped and have been sampled by scout pitting and boring; a magnetic survey was made using the new portable proton magnetometer; garnierite was found on Santa Ysabel in November; all this being done as part of the Ultrabasic Research Project. Full details of the research done, however, is not being published for some time, as it will first be the subject of a thesis¹¹ covering three years of study. This work should be a major contribution to the knowledge and understanding of ultrabasic rocks, as it involves all the known occurrences on the major islands of Choiseul, Ysabel, San Jorge, Florida, Guadalcanal, and San Cristoval—over a distance of 400 miles and under many different and interesting conditions of emplacement. Here and there it will be supported by magnetic and bathy-

By J. C. GROVER

Chief Geologist, Geological Survey Department,
British Solomon Islands.

metric data. It is unfortunate that the study cannot be supported also at this stage by gravity data obtained by submarine.

The visit on May 28 of the Oceanographic Vessel, *Orsom III*, of the Institut Français d'Océanie, Noumea, was of interest both from the point of view of personal contact with scientists of the French Territories, and because it was possible to see the equipment and laboratory set-up on board. Subsequent visits to the Protectorate are planned for future years.

The loss of the M.V. *Melanesian* with all sixty-two souls was an unhappy interruption to the work during the year: the geologists and assistants took their turn in the searching aircraft as observers or in the control room. This and the total wreck of M.V. *Betua* has aggravated the shipping position, and it has been necessary since for the survey to modify its plans so as to help others with the M.V. *Noula*.

For the last five months of the year detailed surveys have been made in the Betilonga Valley and surrounding areas

in the Guadalcanal mountains south of Honiara. Much trenching and pitting was undertaken. Disappointments and difficulties have been many. However, two more substantial bodies have been discovered in the surrounding area, one of which looks more promising than the other. Indications of copper sulphides, talc, magnetite, barytes, and fine gold have been noted, and the regional knowledge has been extended by mapping the rough country southwards towards the backbone ranges, and to the westward in the tributaries of the Betikama-Lunga River, where further mineralization was found.

Further work was done on East Malaita ilmenite and garnet gravels. Further exploration was undertaken also on South Malaita.

Efficiency has suffered because of lack of space and facilities to handle such a number of geologists, and the overall increase in activity. This state of affairs is to be remedied in the immediate future by the construction of a new office and laboratory building.

REFERENCES

1. By Dr. P. J. Coleman.
2. In April, 1950.
3. Messrs. W. White (Senior Geologist), Mr. O. Warin, and Mr. C. Jensen, with two Australian field assistants and twelve Trobriand islanders on board M.V. *Kokoda*.
4. By the Australian Minister for National Development on October 9, 1958.
5. J. H. Hill.
6. P. A. Pudsey-Dawson.
7. To J. Blits, Sydney.
8. Dr. Charles Phipps, Department of Geology and Geophysics, University of Sydney.
9. On behalf of a subsidiary company of the Blits organization.
10. From the Colonial Development and Welfare Scheme.
11. By R. B. M. Thompson, M.A. (Cantab.), who is doing the laboratory research at the University of Sydney. He has been assisted in the field by John H. Latter, B.A. (Cantab.).

Electrolytic Production of Hydrogen and Oxygen

IN connection with the production of hydrogen and oxygen by the electrolysis of water, it should be understood that this process is operated on an extensive scale in the United States, where supplies of direct current are taken advantage of. For the most part, only alternating current is available in the United Kingdom, but direct current only to a very limited degree. Time was when the conditions were reversed, and most current supplied here was of the direct order. The general benefits gained by the substitution of alternating current are already well known, but such current does not suit extensive electro-refining or electro-chemical systems which, with the exception of alkali-chlorine production, are not used here to any appreciable extent.

A Link With Supply

Where direct current is available, the installation of electrolytic cells permits an immediate link-up with the supply as acquired. There is no need for rectifiers or motor converters to convert the a.c. to d.c., far less the earlier forms of generators and transformers to re-arrange this supply to suit the individual cells. A visit to a works in the U.S. showed that it had been necessary to install a rectifier unit costing about £1,000 to convert a.c. to d.c., and for no other purpose. The choice had to be made between a small installation for immediate needs, or a larger, more costly installation (with a view to future ex-

pansion). The benefits of acquiring d.c. directly from a nearby hydro scheme or other sources obviates transmission troubles and permits the current to be consumed with the least possible amount of loss.

Avoiding Current Losses

The modern cell for oxygen and hydrogen production is constructed with every emphasis on the avoidance of current losses, but which advantages would be largely offset if The initial current supply necessitated "manipulation". Provided with d.c., arrangements can be made for the individual units to be connected in parallel or series, so that this current is suitably subdivided without involving any cost.

Unit cells have dimensions of 43 in. x 37 in. x 8½ in. and weigh 325 lb., and large installations engage 1,000-unit cells. It should be understood that electrolytic production of oxygen and hydrogen is only economical if both gases are required. Oxygen by itself is more economically obtained by fractional distillation of liquid air, and hydrogen by itself from water-gas, while hydrogen is a by-product of the alkali-chlorine cell. Some thirty-odd firms in the United States have large electrolytic installations, but in this country there only appears to be a few.

The caustic potash in the electrolyte lasts indefinitely. Until recently, this liquor, augmented by daily additions of fresh distilled water, which is retained for very lengthy periods, was ultimately run to waste, but today it comes in for close inspection. Briefly, American undertakings with these installations include various branches of the iron and steel industry, rolling mills, and foundries, railway repair yards, copper, aluminium, and other metallurgical activities, chemical firms, oil mills, electrical companies, and makers of parts for aeroplanes and automobiles.

By C. C. DOWNIE

THE MINERAL WEALTH OF GUINEA—II.

The World's Largest Lateritic Iron

THE only base minerals so far exploited in Guinea are located in the immediate vicinity of the port of Conakry, thus avoiding the prohibitive freight rates involved in moving considerable ore tonnages from the hinterland to the Atlantic seaboard. Both these bauxite and lateritic iron ores are something of museum pieces.

For many years it has been known that the Kalloum peninsula is the depository of extensive iron orebodies. The construction of the Conakry-Kankan railway and the trenching work it involved brought to light the lateritic features and the hitherto unsuspected thickness of these deposits. Subsequent drilling has shown them to cover an area 20 miles long and from 2½ to 4 miles wide, extending all the way from the peninsula's westernmost tip to the 3,300 ft. high Kakoulima mountain to the east.

It was first surmised that the hard surface crust was alone capable of commercial exploitation. Thirty years ago mining engineer J. H. Sinclair noticed that the powdery laterite underlying it was strikingly akin to Cuba's Mayari laterites, carrying a relatively high iron content. Extensive analyses confirmed his views: the powdery material turned out to be nearly as much iron-bearing as the surface layer. This discovery increased at one stroke the calibre of the deposit tenfold. From tens of millions of tonnes, estimates of their reserves were then raised to hundreds of millions.

These developments led to the establishment in 1920 of the Compagnie Minière de la Guinée Française, which amalgamated all the mining concessions on the Kalloum peninsula. Preliminary reconnaissance called for the drilling of over 300 shallow holes for geological information, aggregating 10,000 ft., plus a score of deeper shafts. Geological, topographical, hydro-electrical, and metallurgical studies were conducted. Thirty thousand tonnes of local ores were shipped in 1938 for blast-furnaces tests in the Saar and Belgium.

Despite the satisfactory results, the company found no outlets for the ores in the immediate pre-war era. The French steel industry had no use for them. Prospective foreign consumers also turned a blind eye: they had access to richer or nearer-to-hand reserves.

But World War II resulted in an intensive exploitation of worked ore deposits. Confronted with a foreseeable depletion of available resources, users were now willing to take an interest in building up reserves. Thus Great

Britain's B.I.S.C. (Ores) Ltd. went into partnership with the Compagnie Française des Mines de Bor and the Compagnie Franco-Américaine des Métaux et Minerais. They jointly set up in 1948 the Compagnie Minière de Conakry. Following detailed studies and further satisfactory tests in British blast-furnaces, it was decided two years later to bring the local orebodies into exploitation.

Laterization Process

This considerable spadework established the following facts. From the geological viewpoint, the Kalloum ores are the result of a surface alteration. The highly basic rock, containing a good deal of iron and magnesium (dunite) which forms the substratum of the peninsula, underwent a laterization process. The host rock outcrops unfrequently here, but has been encountered on the surface of some valleys located to the north of Conakry.

A common occurrence in that part of Africa lying south to 15 deg. N., the laterization process is little known. This much is certain. The disintegration of rock silicates has resulted in more or less heavy concentrations of silica, alumina, and iron oxides. The concentration has been brought about by the elimination of either of the above oxides. As this phenomenon has yet to be observed in temperate climes, it is surmised that the fiery tropical sun, as well as regular alternations of wet and dry seasons, may well have something to do with it.

Studies on laterites have shown that, when it comes to deposits originating from the alteration of basic rock, these include the three following layers: the bottom consists of soft and easily crumbling ores; the top is a very hard crust of cemented laterite; sandwiched in between there is an intermediary zone.

Since the local orebodies run true to pattern, they comprise the three aforementioned layers. The bottom ores, extending more than 66 ft. in depth, are soft and extremely fine. This fineness calls for briquetting prior to use in blast furnaces. This is a relatively expensive operation by the current method, so a cheaper process is being sought.

The hard surface ores come in massive concentrations resembling scoriae, and are black or very dark in colour. They are more often than not vacuolar, infrequently com-



A view of the port of Conakry. The Los Island group can be seen from the docks

Ore Deposit

By Maurice Moyal

*Editor of "Petroleum Mirror,"
the monthly newsletter of the French petroleum industry.*

pact. They represent the final stage of the laterization process.

The intervening type consists of soft concentrations, vacuolar and red in colour. The vacuoles are filled with an ochre dust. This rock is characterized by a remarkable property: it takes a hard consistency after a few days' exposure to air. The thickness of the top and intermediary layers averages some 35 ft.

These three types do not differ so widely from the chemical viewpoint. Noteworthy are the facts that the intermediate type includes more free water than the hard material, and that its ochre dust carries less iron and more alumina. This feature tends to show that this type must have originated from the elimination of the alumina in the dust.

A considerable programme of analyses has indicated the following average content for the three types:

Material	Percent
Iron	51.50
Alumina	9.80
Silica	2.50
Chrome	1.25
Magnesium	0.30
Sulphur	0.10
Phosphorus	0.06
Nickel	0.02

True to origins, the ores include a small amount of silica. But, oddly enough, they carry only traces of magnesium, whereas the host rock is high in it. They contain a large percentage of alumina, but they share this feature with quite a few exploited deposits. Their relatively large chrome content has not impeded their utilization. Contrariwise to Cuba's Mayari ores, they assay almost no nickel.

The Kalloum peninsula's is the largest deposit of lateritic iron ores in the world. By reason of its very large extent—some 70 sq. miles—it has been so far impossible to give any proved figures as regards reserves. Probable reserves have been put at 2,500,000,000 tonnes, averaging 47 per

cent metal content. This much is certain: some of the richer zones carry a proved 150,000,000 to 200,000,000 tonnes, averaging more than 50 per cent iron and less than 2 per cent chrome. These figures apply only to the hard surface crust.

The orebodies are being readily worked by opencast methods. So far only the top layer has come in for exploitation to the extent of 846,900 tonnes in 1956 and 1,090,000 tonnes for 1957. The operator expects to get out of the deposit 1,200,000 tonnes of ore at the first stage, to be increased to a final 3,000,000 tonnes when exploitation is in full swing.

Other Iron Indications

The Guinea Mining Service uncovered the Yomboéili orebodies in 1944. These iron ores occur in a table-shaped hill covering some 65 acres in area. The location is some 75 miles south-east of Conakry, in the immediate vicinity of the Sierra Leone border.

Here again the ores are the result of surface alteration, and come in three layers: the hard surface crust consists of crystallized iron oxide ologist blocks, cemented together by limonite; immediately below lies a stratum of soft and easily crumbling ores; the bottom is made up of primary ores in ologist layers embedded in quartzites, resembling Brazil's itabirites.

The metal content of these three types again varies widely. The hard surface crust and the soft ore in the richer zones have assayed an iron content ranging from 40 to 60 per cent. But these soft sectors could not be exploited without beneficiation. The same applies to the quartzites, which carry only 20 to 35 per cent metal.

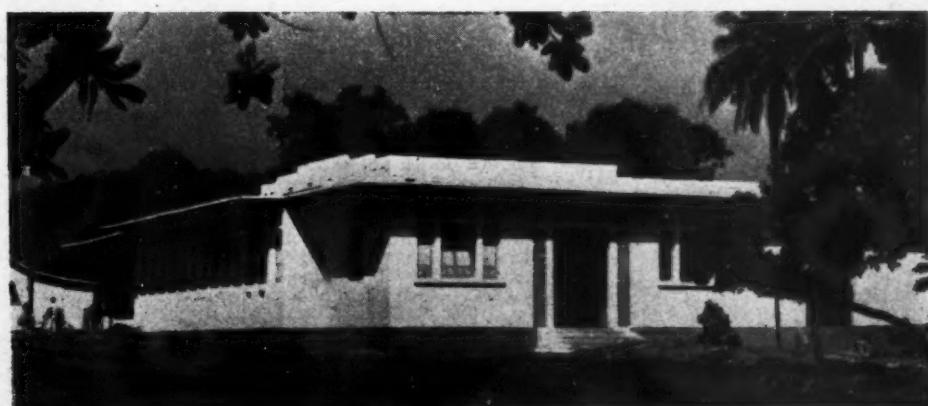
Such quartzites belong to the formations known in Sierra Leone as the Marampa schists, which yielded the Masabaitauki iron mines, under exploitation for twenty years or so. These formations extend into Guinea right under the sandstone cover rock of Primary age.

Since the Yomboéili deposit is located along the northern bank of the Kollente river at less than thirty miles from the Atlantic seaboard, it came in for semi-detailed prospecting at the hands of the General Government of French West Africa and the Société Française d'Exploitations Minières.

Prospecting work carried out in other regions encourages the belief that the country is the depository of other occurrences.

(To be continued)

Dispensary at the hospital at Ballay. Such services as exist must be provided from inception of mining



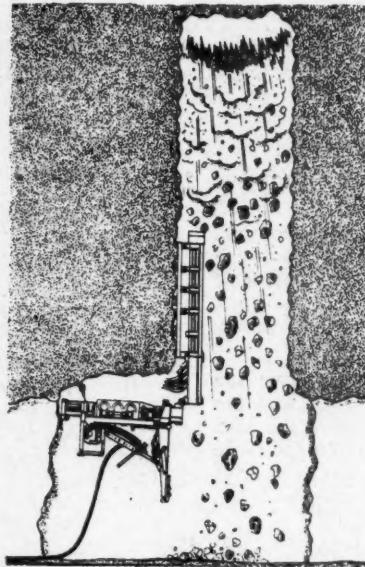
Raising Vertical and Inclined Shafts

WHAT may be considered as one of the most expensive, dangerous, and technically difficult tasks in mining is the driving of raises or the opening of inclined shafts from below. As a possible answer to this problem, and already installed in certain Scandinavian iron ore mines, a portable climbing drilling platform that provides a most interesting conception was demonstrated to the Press on Wednesday last week. This platform is manufactured by Alimak and imported into the United Kingdom under licence by A.C.E. Machinery Ltd. Overseas sales of the new equipment are handled direct by Alimak save for those in the United Kingdom and the British Commonwealth, which are completed through the usual A.C.E. channels.

Ancillary Equipment

The demonstration was staged on the quarry face—facilities were provided through the courtesy of the Brecon and Clodhill Lime Works Ltd.—to simulate the driving of a raise, and the arrangements were carried out in conjunction with the Consolidated Pneumatic Tool Co. Ltd., who furnished all the compressed air plant, rock drills, and ancillary equipment required. This comprised a Power Vane oil-flooded rotary air compressor of 210 c.f.m. F.A.D. capacity with rock drills, roof bolting tools, and impact wrenches. Basically the Ace/Alimak equipment consists of an all-steel platform driven by compressed air at 80 to 100 lb. pressure to climb a rack-equipped guide rail. All services are carried in the rail sections—air and water for drilling, ventilation and firing cable. The platform is equipped to carry all necessary drilling tools.

The platform is transported in the tunnel on a special transit trolley, the overall height being 8 ft. In exceptionally low galleries, the platform can be transported on its side on the trolley, and the complete equipment can be easily dismantled



Above, the elevator in the blast. Below, left and right, the elevator is seen under demonstration conditions on the quarry face. At left, fitting a new section of guide rail, and at right, drilling from the platform

to take up or down in mine lifts, etc. When starting the raise, the platform remains on its trolley, which is stabilized by three jacks. Blast holes are drilled in the roof and charges placed for the initial blasting. The platform is then wheeled out of the way of falling rock and debris before the charges are fired. Two rounds are normally blasted in this manner to give a raise of 10 to 13 ft. start.

Stages of Demonstration

The demonstration commenced at the next stage which is the fitting of the first rail section. The rock face was trimmed with a CP 22 lb. pneumatic pick and a vertical timber bed erected for the guide rail. This was mounted by drilling eight bolt holes with the CP-32F drill, and eight expansion bolts of a type and length suited to the rock material were driven and tightened with a CP-360RP impact wrench. Air and water hoses were brought to their connections at the mounted guide rail.

With the platform now being supported on the rail, mounted on the rock face, the trolley was wheeled away. The operator on the platform was then able to drill more bolt holes and fix more sections of rail. Under actual mining conditions a recess is blasted out at the floor level so that the platform, together with hinged bottom rail section, can be folded under the overhanging rock pentece whilst blasting operations are carried out. During this time the top of the guide rail is protected by a guide rail head box which contains valves and outlet fittings for compressed air and water, electric firing

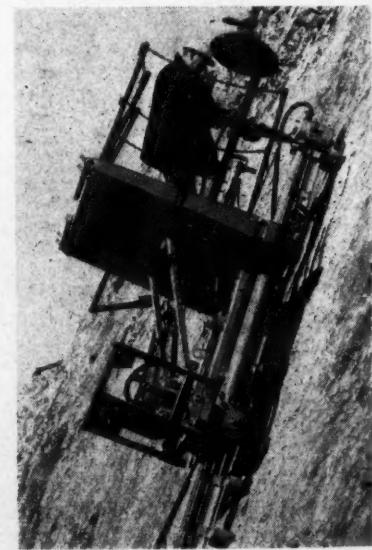
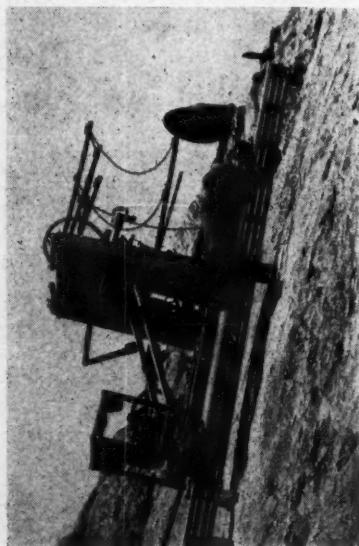
cable connections, etc. The guide rail head box cover also contains a valve for ventilating the shaft, and after a round has been fired, air and water are thoroughly mixed to remove all traces of the explosion gases. This blowing out is controlled from the tunnel floor. After about half an hour, the operator can safely mount the platform to clear the rock face.

The demonstration illustrated that when clearing the rock face the operator is protected from falling lumps of rock and debris by a detachable bell cone which is fitted to the platform. Similarly, while ascending, the operator sits on a seat under the platform for further protection. A manhole cover is fitted to the platform which can be opened from above or below. Clearing completed, a further rail section is added and the cycle repeated.

Wide Range of Applications

The equipment is equally suitable for vertical and inclined shafts, and special curved rail sections are available for use where the raise changes direction or for S-type shafts. Safety measures include a telephone communication between the working platform and the tunnel floor. The platform can also be lowered by turning a hand crank should the air supply be cut off. The platform is equipped with a tool box, special climbing irons, a grapping hook, and a life-line. With the help of the equipment, the driller may climb down to the tunnel floor along the guide rails if the compressed air supply should fail or the hand crank not operate.

The platform has a climbing speed of 33 ft./min., a lowering speed of 50 ft./min., and its lifting height is claimed as being "practically unlimited". Maximum load is approximately 1,100 lb. and minimum shaft area for operations is 6 ft. 8 in. by 6 ft. 8 in.



Technical Briefs

Developments in Ore Treatment at Kennecott Copper

Ray Mines Division of Kennecott Copper Corporation has recently completed a \$40,000,000 modernization programme at Hayden, Arizona, involving the introduction of a new leach-precipitation-flotation plant and a new smelter capable of producing 250 tons per day of copper. By means of this technique, which was first introduced at Anaconda, it is hoped to recover a further 2 lb. of copper per ton over the amount that can be recovered by sulphide flotation alone. The technique will allow lower-grade ore to be treated, consisting largely of schist ore, in which oxidation is more pronounced.

The standard leach-precipitation flotation process is used, making the sulphuric acid required from pyrite recovered in the tailing. The sponge iron for precipitation is also derived from the iron oxide calcine, and the manufacture of this sponge iron is the critical part of the flowsheet.

In the Hayden plant, a sand-slime separation is made on the crude ore discharged from rod mills. The sand fraction is leached in drums, washed to remove copper sulphate and any excess acid, and then ground in ball mills for conventional alkaline copper sulphide flotation.

The slime fraction is leached with the acidic copper-bearing pulp overflowing the washing classifiers in the sand leaching circuit, and further acid is added to maintain a pH of 2.0 to 2.2. The next stage is copper precipitation, where the sponge iron is added in precipitators, after which flotation removes both the cement copper and the sulphide, employing an acid circuit. These developments were the subject of comprehensive description in *The Mining World* of January, 1959.

FROTH FLOTATION IN PHOSPHATE ROCK BENEFICIATION

For many years the practice in phosphate rock beneficiation plants has been to split the washed feed by screening and hydraulic classification into three fractions, plus 14 or 20 mesh which is not treated, 20 to 65 mesh which is treated by agglomerate tabling, agglomerate screening or conveyor belt flotation and the -65 mesh material which is treated by froth flotation. Usually -150 mesh slime is separated by means of cyclones and discarded. At Cyanamid's Grange Park plant, the agglomeration technique has been replaced by a froth flotation stage which is claimed to yield equal or better results than other methods and at the same time requires less capital investment, less floor space and less operation costs.

Briefly, the flow sheet consists of splitting the flotation feed into two fractions after desliming by use of hydraulic classification and screening, the product being floated separately. Classification is carried out in a 6 pocket Dorr-Oliver sizer, the first two pockets delivering plus 20 mesh, followed by approximately 20 to 60 mesh and a -65 mesh fraction. Undersize in the so-called +20 mesh material is screened to remove undersize. The -20 +65 mesh fraction is deslimed

in rake classifiers conditioned in a rotary mixer before flotation in air cells designed by the company. Rougher concentrate from this section joins the -65 mesh feed, is conditioned in the normal manner and treated in another section of rougher cells. Conventional reagents (fuel oil, tall oil and caustic soda) are used and the final cleaning is carried out by the removal of the collector coating by means of acidification and cationic flotation for removal of silica.

This development is particularly interesting because of the application of the practice of floating a sized feed — a practice which has been suggested as desirable because flotation time, intensity of agitation and other factors should be more easily controlled with a more closely sized feed. Flotation of 20 to 65 mesh material is also a new departure but it seems doubtful whether such a froth flotation technique can replace agglomeration or table flotation for material coarser than 20 mesh or for high specific gravity ores.

FLOATING AUTUNITE

Experiments at the Mining Research station, State College of Washington, on the amenability of autunite ores from the Spokane Indian Reservation area have proved that autunite, which is the chief mineral constituent, can be floated successfully. A similar technique was used for other similar ores with a certain degree of success.

As fatty acids are the only type of collector which shows promise, work was confined to this class and the best combination was found to be an emulsion of one part stearic acid, one part sodium oleate, 1.2 parts kerosene and 100 parts water. Conditioning at a high pulp density in a drum mixer with pH adjusted 8.5 to 9.0 (using sodium hydroxide) is necessary. A recovery of some 80 per cent to 97 per cent is reported over a number of tests with a ratio of concentration between 60 and about 6 to 1.

SLIME FLOTATION

Investigation has been going on for some time into the problem of "slime" flotation both in Germany and in the U.S. The outcome of some of this work has been reported by the U.S. Bureau of Mines (Rep. Invest. 5444).

As one phase of the general problem of recovering sulphide slimes, research has been conducted on tailing from St. Joseph Lead Co. to recovery of a significant portion of the residual, finely divided galena. Only a reasonable ratio of concentration was sought as a start and results show that from a feed averaging 0.2 per cent Pb (and about 70 per cent -400 mesh) a recovery of up to 45 per cent was made in a rougher concentrate assaying up to 6.5 per cent Pb.

In general it was found that flotation was possible by using larger quantities of xanthate and sodium sulphide than are normally employed. For instance as much as 0.5 lb. of xanthate was effective and additions of sodium sulphide ranging from 0.3 to 2.0 lb. per ton improved recovery. This reagent is normally detri-

mental to flotation of galena but, of course, if one assumes appreciable surface oxidation of the galena having at the same time a high specific surface it is not unreasonable.

Another interesting and promising approach needing further research is fractionation in a hydraulic cyclone before flotation treatment.

CRUSHING TECHNIQUES

A combined roll crusher and a hammer mill has been developed by O'Brien Industrial Equipment Co. to deal with materials that tend to build up. The hammer shaft and the roll are driven independently.

The effect of thermal treatments on grindability will be discussed at the A.I.M.E. general meeting, but it would appear that although significant changes in grindability can be achieved by controlled heating, it is only usually economic in very special cases.

It is reported that Fred C. Bond will produce evidence that input yields equal new crack length in ore ground to different sizes, and give a new method of calculating crack lengths and surface areas.

CANADIAN DEVELOPMENTS

Interesting reports from the Mines Branch, Department of Mines, Ottawa, give the highlights of Canadian endeavours in the field of metallurgical research.

An investigation has been made to study the possibility of reducing acid requirements at controlled pH by recycling a portion of the leach liquor as make-up solution with fresh ore. It was found that at pH 1.8, a reduction could be made from 44.2 to 38.7 lb. per ton on a siliceous ore ground to 75 to 80 per cent minus 200 mesh. A reduction in the amount of sodium chlorate was also possible and it was established that recycling had no significant effect on the amount of uranium extracted (Report R 28).

Losses of paraffin in the barren raffinate derived during solvent extraction of uranium from a leach liquor has been determined by the addition of C^{14} -labelled decane to the circuit, as this material is a homologue of the major constituent of paraffin. In this way, the activity can be measured by means of a single channel beta-ray spectrometer and an average value of 33 ppm paraffin was found in the raffinate (Report R 25).

ULTRA-SONIC GENERATORS

Ultra-sonics have been employed for various purposes, including the precipitation of emulsions and fatty acids and neutral oils used in flotation. For this reason, a recent paper describing various types of ultra-sonic generators in *Génie Chimique* (France) is worth studying by those interested in emulsions. ("Les Ultra-sons en génie chimique," by J. Palmé, Vol. 80, No. 6.)

MINING MISCELLANY

A copper mine in Namaqualand, in the north-western Cape Province, has been declared a national monument. This is the site where Simon van der Stel, governor of the Cape, sank a shaft in 1685 during his famous journey of exploration. *

A party of Australian geologists is travelling to New Zealand this month to investigate zinc ore deposits in the area of Fiordland National Park, South Island. The area contains old copper mines and other mineral workings, first opened up around the turn of the century. *

Three active mines at Wilkes-Barre, United States, containing 50,000,000 tons of anthracite, will be protected against flooding under a \$700,000 State-Federal mine drainage project recently approved by the U.S. Department of the Interior. The project involves the installation of three deep well turbine pumps, each with a capacity of 5,000 g.p.m., that would hold an underground pool to a safe level in several abandoned mines and thus prevent inundation of adjacent active mines. Costs of the project will be shared between the United States Government and the Commonwealth of Pennsylvania. *

The mineral exploration carried out by Egyptian Government teams in the desert region near Luxor has resulted in the discovery of radioactive material. An announcement from Cairo states that samples of the metals discovered are being tested in the laboratories of the Egyptian Organization for Atomic Energy. Some weeks ago, the finding of further radioactive minerals, particularly uranium, was reported from the Fayoum district. *

There was a drop of 100,000 tons in ore exports from Sierra Leone during 1958. Shipments during last year amounted to 1,400,000 tons. The Sierra Leone Development Company's supplies of lump ore will be exhausted by the end of this month, and thereafter the entire production from Marampa will be iron ore concentrates. A second mill for concentrate production is to be commissioned soon. *

A high-grade orebody of 30 per cent manganese ore has been uncovered near Boulder City, United States. *

The Rico-Argentine Mining Co., Colorado, is preparing shipments of lead and zinc ore for the first time in eighteen months, as the company's flotation mill is now being put back into operation. *

Goldfield Engineering Associates Inc., operating in Nevada, has obtained a 10-year lease on the Gold Banner and Santa Claus claims on the east side of Columbia mountain. A new tunnel on the Santa Claus has been driven to 450 ft. to intersect the Columbia mountain fault, while work on the Gold Banner has been

extended to 1,000 ft. The development operations have been concluded in a completely altered Cambrian shale formation with values running as high as \$30 per ton. *

Defined reserves of 1,800,000,000 tons of steam coal and 420,000,000 tons of coking coal—together with probable reserves estimated at ten times these figures—are attracting State concerns and private mining houses to the Waterberg district of the Northern Transvaal. It is expected that batches of coal from this area will be investigated at the pilot plant of the Fuel Research Institute in Pretoria this year. *

New goldfields have been discovered in the Oimyakon district of Siberia, which has the lowest temperatures in the Northern Hemisphere. The gold sands lie under a layer of permafrost rocks. *

Work will start this year on a new mine at Vorkuta, Siberia, in which coal cutting, conveying, and prop setting will be accomplished automatically by machines. *

The Belgrade foreign trade company, Jugometal, has reached a long-term agreement with a Sudanese firm for the purchase, prospecting, and joint exploitation of iron ore in the Red Sea area. Two plants are to be built in the Sudan. *

With a production last year of more than 11,000,000 tons, China has become the seventh largest producer of steel in the world. She produced 10,700,030 tons in 1957. *

Japanese production of aluminium last year was 84,580 tons as against only 67,980 tons in 1957. Exports totalled 4,536 (236 tons). *

The Commission on International Commodity Trade has begun a two-week session in New York and elected Mr. Costa Caranicas, of Greece, as its chairman. Professor Enrique Rodriguez Fabrigat, of Uruguay, was elected first vice-chairman and Dr. Zarin Zain, of Indonesia, second vice-chairman. In an introductory statement to the 18-member Commission, Mr. Caranicas said that since the Commission's last session, in May, 1958, no major changes in the overall situation of the international commodity trade had taken place. He recalled that commodity indices attained their best level for 1958 in July. Although there had been no drop in the quantum of primary commodity exports since then, Mr. Caranicas said, "The fact remains that more and more countries are faced with the necessity of adjustment to levels of consumption and investment below those recently experienced". The long-term factors affecting commodity markets, he added, had been singled out for particular attention in the Commission's current agenda. *

PERSONAL

Mr. D. J. R. Martin, B.Sc., A.Inst.P., of the Mining Research Establishment, has received one of the six premium awards given by the Radio Industry Council of 25 guineas each for articles on radio and electronics published in the technical Press during 1958. The award was given for Mr. Martin's article "New Types of D.C. Amplifiers", which appeared in the *Electronic and Radio Engineer*, January to February, 1958. *

Mr. J. C. Duckworth, B.A., F.Inst.P., A.M.I.E.E., F.Inst.F., is to become managing director of the National Research Development Corporation this year. This is a statutory appointment made by the Board of Trade under the Development of Inventions Act, 1948. *

Mr. E. N. Lowe, formerly senior export executive of British Thermoplastics and Rubber Manufacturers, has been appointed general overseas manager in charge of all export activities of the group. Mr. I. Keith has been appointed general manager of the hose division of the group, and Mr. C. K. W. Lewis and Mr. J. S. Exley are to be respectively home marketing manager and special assignments manager of the group's belting division. *

Mr. Gordon Helps, joint managing director of Humphreys and Glasgow Ltd., has retired some twelve months short of normal retirement age on account of ill health. He was also a director of Gaz à l'Eau, the French associate company of Humphreys and Glasgow. *

Mr. J. M. Storey, managing director of Dewrance and Co. Ltd., has been appointed vice-chairman of the Council of British Manufacturers of Petroleum Equipment. *

Sheepbridge Engineering Ltd. have announced various changes in the structure of subsidiary companies. Mr. R. W. T. Bray has severed his connection with Bray Construction Equipment Ltd., Faggs Road, Feltham, Middlesex. Mr. D. J. Harrowell, formerly technical director, takes over as managing director.

COMPANY NEWS

St. Patrick's Copper Mines of Avoca, County Wicklow, subsidiary of the Mogul Mining Corporation of Toronto, have told staff that they are to introduce a seven-day week instead of the six-day week in force at present. *

Two enterprises, highly important for the industrial development of Israel, the Dead Sea Potash Works Ltd., and the Dead Sea Bromine Co. Ltd., will soon merge under a unified board of directors. Approval of the unification has already been given by the Inter-Ministerial Economic Committee. The chairman of the new board will probably be General M. Makleff, at present heading the Dead Sea Works. *

At the Cleveland, Ohio, Coal Show, to be held from May 11 to 14, Dowty Mining Equipment will show recent developments in automatic hydraulic roof-support systems. We understand that Dowty is the only British company exhibiting at the Coal Show.

Metals and Minerals

U.S. Barter Deals

The Department of Agriculture has removed eight strategic minerals from its list of foreign-produced materials eligible for barter for United States farm surpluses. The materials dropped are cadmium, metallurgical grade chromite, ferrochrome, acid-grade fluorspar, commercial battery grade manganese, natural Grade A battery grade quartz crystals, and ruthenium. The department had previously removed industrial diamonds from the list. All nine types of minerals will no longer be considered eligible for barter because their quotas have already been filled.

These changes do not affect the barter agreement for Indian manganese ore against United States wheat, referred to once again in our last week's issue, which has at last been signed. The deal has yet to be finalized, however, for all that has so far been achieved is an agreement to negotiate. Definite terms of sales, amounts, and other details, could possibly hold up or seriously delay the final transfer of materials. There have also been statements to the effect that materials other than manganese ore and ferro-manganese would be included in the pact.

Whereas manganese ore and ferro-manganese are not now eligible for barter with the U.S. Commodity Credit Corporation, many concerns in New York consider there is a good possibility that ferro-manganese and possibly manganese ore will be put back on the C.C.C.'s barter export list. From Japan, the Mitsui, Mitsubishi, and Kinoshita companies have offered a barter deal involving some 200,000 tons of ferro-manganese for which they would take soya beans and/or certain other United States surplus farm products.

In view of the improving outlook for tin, it is scarcely surprising that reports from Kuala Lumpur refer to the seeming reluctance of the Malayan tin industry to accept a reported American offer to exchange surplus farm produce for tin. Leaders of the industry are quoted as stating that the products offered by the United States—tobacco, unprocessed cotton, powdered milk, wheat, rice, and grains—were not of great interest to them.

A recent report from Bangkok stated that the United States was accepting 2,250 tons of Thai tin in exchange for tobacco. The tin would come from mine stock outside the normal permitted export quota.

PLATINUM RISES AGAIN

A further sharp rise in the price of platinum occurred on March 6, when Rustenburg Platinum Mines and its selling agents in the United Kingdom, Johnson Matthey, increased their quotation to £28 10s. per oz. from £25 previously. As from March 9, Baker Platinum raised its price by a similar amount.

The increases by the two leading United Kingdom refiners have not so far had any effect on free market prices, which are still indicated at £26 5s. to £27 10s. per oz. Whether the free market will move still further upward must

obviously depend mainly on the rate of fresh demand for free supplies, which has turned quieter since the rally in platinum prices began about three weeks ago.

Johnson Matthey, and Baker Platinum have advanced their price for palladium from £6 10s. to £7 5s. per oz.

CHROME AND MANGANESE

The manganese ore shipment market still remains fundamentally unchanged, with not a great deal of interest reported from buyers in the United Kingdom and elsewhere, and with few indications to suggest any likely improvement in the immediate future.

Not only has the United Kingdom completely covered her requirements for this year, but she is still in possession of substantial stocks of high-grade material. She is, therefore, expected to be out of the market for the rest of the year. In the United States, there is a tendency on the part of buyers to keep their intake as low as possible because of prospects of a strike in the steel industry at mid-year.

If demand were to pick up, doubtless improved inquiry for marginal tonnages would result, but at the moment there is nothing to suggest that this will happen. Even if demand improved in a number of directions, it is considered unlikely that prices would be appreciably affected, since there appears to be plenty of ore about.

So far, the pick-up in United States steel production rates has not caused any corresponding gains in buying of manganese ores.

Exports of chrome ore from the Central African Federation fell to 316,816 tons during the period January to September, 1958, from 575,025 tons in the corresponding period of 1957, according to figures issued by the Central African Statistical Office. The respective values of exports were £2,379,060 and £4,588,991. The demand for all three grades is being slow to revive, although metallurgical is reported to be receiving slightly more attention than the other two.

The Turkish ore industry also remains very much in the doldrums. Apart from the present unimpressive rate of demand, sales of Turkish ore are probably being adversely affected by the uncompetitive level of prices. While Turkey is admittedly a high-cost producer, the minimum prices fixed by the government are regarded as unrealistic.

Adding to the generally uncertain state of the market is the fact that Russian ore is available at very keen prices. Much of the Russian ore is crumbly, and this type of ore is not always very acceptable to some users. According to some reports, Russian ore is available at about £13, which compares with current quotations of £15 15s. per ton for Rhodesian metallurgical grades.

A Japanese firm, the Keikei-Koeki Trading Co., specializing in trade with the Soviet Union, has announced the conclusion of a contract with the U.S.S.R. to import about 1,200 tons of

chrome ore from that country. While the quantity involved is small, the fact that this will be Japan's first import of Russian chrome ore in two years is not without significance. The import price of Russian ore, to be shipped during the period April-May, was fixed at \$U.S.34 per ton c.i.f. Japan for supplies of 48 per cent metal content. The current Japan-U.S.S.R. agreement provides for imports of 20,000 tons of chrome ore from the Soviet Union annually.

WOLFRAM MARKET QUIET

The general level of trading in wolfram ore has remained disappointing since the year began. It was last December that prices reached 95s. to 100s. per ton c.i.f. Europe, after climbing steadily from around 62s. 6d. in August. From the December peak, prices have drifted down to 84s. to 89s.

At the moment, there appear to be no indications of any immediate revival of activity in the market. Ferro-tungsten buyers in Britain appear to be covered for the time being. When prices for ore were rising during the closing months of last year, it was estimated that enough ferro-tungsten had been bought to last some six months. However, it is possible that in the course of the next few weeks British buyers might again be thinking of re-entering the market. Whether demand generally will then be on a broad enough scale to cause an appreciable turn round in ore prices remains to be seen.

HIGHER ZIRCON PRICES

The zircon shipment market has lately displayed a decidedly firmer tone. There has been a considerable revival of demand, both on European and United States account, but more especially the latter, while supplies are not too readily available. Since zircon and rutile are products of the same mining operations, the curtailment of rutile output has automatically affected that of zircon.

DEMAND FOR ALUMINIUM RISING

Rising demand for aluminium is resulting in increased production by the largest United States producer. Alcoa has announced that one of two idle potlines at its Rockdale, Texas, smelter, will be restarted on March 16. This will be the second Alcoa facility of its kind to be put back into operation in a month. Alcoa is also accelerating bauxite mining operations at its ore-bearing properties in Arkansas, and is to step up alumina output at Bauxite (Ark.) and Point Comfort (Texas).

Reynolds Metals has noted an accelerated pick-up in orders in the past few weeks, which may indicate that customers are again building up inventories. Reynolds expects that 1959 will be a year of higher sales and shipments. The company has announced the formation of Reynolds International Inc. as a separate unit with independent management. This was formerly the overseas manufacturing and sales section. The move reflects the increasing importance of the company's stake in world aluminium trade, particularly now that a 47 per cent interest in British Aluminium has been acquired. Reynolds International also has interests in Canada, Mexico, Cuba, Colombia, the Philippines, West Germany, and Ireland.

COPPER · TIN · LEAD · ZINC

(From Our London Metal Exchange Correspondent)

A satisfactory undertone has been maintained on the market during the week. Tin prices have rallied substantially, whilst copper has been particularly well supported following general increases in prices of the metal. Lead and zinc have remained steady.

COPPER IN STRONG DEMAND

At the end of last week, and effective from Monday, the United States producers raised their quotation 1½ c. to 31½ c., which is 6½ c. higher than the low price ruling during the early part of last year. However, the new quotation is still ½ c. below the custom smelters' price, which was raised a second ½ c. during the week to 32 c. Conforming with these higher levels, the Belgian producer has advanced the electrolytic price in two stages from 33 B.frs. through 34 B.frs. to 34½ B.frs. per kilo, and the International Nickel Co. of Canada are now quoting 30½ Can.c. delivered Toronto, compared to 29 Can.c.

The strength of the copper market is still maintained by good United States advices, where Comex has been firm in active trading. Customs smelters have withdrawn as sellers following the withholding of supplies of scrap from the market by dealers in anticipation of higher prices. Their buying price for No. 2 wire advanced ½ c. to touch 26½ c.,

which brought out considerable offerings before slipping back to 26½ c. Currently, the price is again 26½ c., but even so supplies are limited, which seems to indicate a further rise in the customs' refined quotation. The main producers are in the position of having to allocate their available supplies to their customers following heavy demand from fabricators.

Undoubtedly, the United States duty of 1.7 c. on copper is having a marked effect on the rate of imports, as the present price structure offers foreign producers a better return for their metal by basing their sales on the L.M.E. price. United States imports of copper in 1958 amounted to 448,410 s.tons, which was the lowest since 1940. At the background of the price rise, particularly as far as the United States is concerned, is covering by consumers against the possibility that labour disputes may interfere with production when union contracts expire in the middle of the year.

Of the strikes mentioned in our last report, full work has been resumed at El Teniente, but Kennecott's mine in Arizona is still closed. In addition, labour trouble broke out at the Anaconda properties in Montana, resulting in the company suspending production for a short period. This dispute involves the two rail unions and the Mine Workers' Union over who should load ore into the railway trucks at the mine.

LONDON METAL AND ORE PRICES, MAR. 12, 1959

METAL PRICES

Aluminium, 99.5%, £180 per ton
Antimony—
English (99%) delivered, 10 cwt. and over £190 per ton
Crude (70%) £190 per ton
Ore (60%) bases 19s. 6d./20s. 6d. nom. per unit, c.i.f.
Arsenic, £400 per ton
Bismuth (min. 1 ton lots) 16s. lb. nom.
Cadmium 9s. 0d. lb.
Cerium (99%) net, £16 0s. lb. delivered U.K.
Chromium, Cr. 99% 6s. 11d./7s. 4d. lb.
Cobalt, 14s. lb.
Germanium, 99.9%, Ge. kilo lots 2s. 5d. per gram.
Gold, 24s. 4d.
Iridium, £19/£21 oz. nom.
Lanthanum (98/99%) 15s. per gram.
Manganese Metal (96% - 98%) £245/£250
Magnesium, 2s. 3d. lb.
Nickel, 99.5% (home trade) £600 per ton
Osmium, £16/£17 oz. nom.
Osmiridium, nom.
Palladium, 5s. 5d./5s. 10s.
Platinum U.K. and Empire Refined £25 0s. oz.
Platinum U.K. and Empire Refined £25 0s. oz.
Imported £26/£27
Quicksilver, £74/£75 ex-warehouse
Rhodium, £40/£41 oz.
Ruthenium, £13/£15 oz. nom.
Selenium, 50s. 0d. per lb.
Silver, 79s. 0d. f.o.b. spot and 79s. 0d. f.o.d.
Tellurium, 15s./16s. lb.

ORES AND OXIDES

Bismuth	30% 5s. 0d. lb. c.i.f.
Chrome Ore—	20% 3s. 3d. lb. c.i.f.
Rhodesian Metallurgical (semifriable) 48% (Ratio 3 : 1)	£15 15s. 0d. per ton c.i.f.
" Hard Lumpy 45%	(Ratio 3 : 1) £15 15s. 0d. per ton c.i.f.
" Refractory 40%	£11 0s. 0d. per ton c.i.f.
" Small 44%	(Ratio 3 : 1) £14 0s. 0d. per ton c.i.f.
Baluchistan 48% (Ratio 3 : 1)	£11 15s. 0d. per ton f.o.b.
Columbite, 65% combined oxides, high grade	nom.
Fluorspar—	
Acid Grade, Flotated Material	£22 13s. 3d. per ton ex. works
Metallurgical (75/80% CaF ₂)	15s. 0d. ex. works
Lithium Ore—	
Petalite min. 34% Li ₂ O	40s. 0d./45s. 0d. per unit f.o.b. Beira
Lepidolite min. 34% Li ₂ O	40s. 0d./45s. 0d. per unit f.o.b. Beira
Amblygonite basis 7% Li ₂ O	£25 0s. per ton f.o.b. Beira
Magnesite, ground calcined	£28 0s./£30 0s. d/d
Magnesite, Raw (ground)	£21 0s./£23 0s. d/d
Manganese Ore Indian—	
Europe (46% - 48%) basis 57s. 6d. freight	nom.
Manganese Ore (43% - 45%)	nom.
Manganese Ore (38% - 40%)	nom.
Molybdenite (85%) basis	8s. 11d. per lb. (f.o.b.)
Titanium Ore—	
Rutile 95/97% TiO ₂ , (prompt delivery)	£34/£35 per ton c.i.f. Aust'n.
Ilmenite 52/54% TiO ₂	£11 10s. per ton c.i.f. Malayan
Wolfram and Scheelite (65%)	8s. 0d./8s. 0d. per unit c.i.f.
Vanadium—	
Fused oxide 95% V ₂ O ₅	8s./8s. 11d. per lb. V ₂ O ₅ c.i.f.
Zircon Sand (Australian) 65 - 66% ZrO ₂	£14 0s. ton c.i.f.

Apart from a short reaction at the end of last week, when settlement of the El Teniente was known, London Metal Exchange prices have continued upwards. Although United Kingdom stocks were again appreciably higher last week, rising by 850 tons to 8,067 tons, a small backwardation is still maintained. Demand from the Continent and Western Germany in particular showed definite signs of improvement following the establishment of higher prices.

TIN'S SHARP RECOVERY

Disappointing consumer demand resulted in lower tin prices early in the week, both in London and Singapore, where the Eastern quotation declined some £23 from the recently established high, before recovering sharply. The nationalized tin mines in Bolivia have been strike-bound for a week over the dispute with the controlling authorities regarding certain fringe benefits, but it is possible that a compromise will be reached shortly.

United Kingdom stocks declined last week 667 tons to 12,182, but in spite of this the contango rate still runs at about £4 per ton. On Thursday morning, the Eastern price was equivalent to £825½ per ton c.i.f. Europe.

U.S. LEAD-ZINC MARKETS

The United States lead price has been increased ½ c. to 11½ c. per lb. New York, following a marked increase in buying activity, and sales of about 25,000 tons during the week were estimated the highest for some time. In this market also, dealers have been reluctant sellers of scrap in anticipation of higher prices, and consequently consumers have been compelled to switch to a certain extent from the secondary smelters to the primary producers. The market has also derived some support from the strike at the Broken Hill mine in Australia over a small domestic matter, but latest reports indicate that a return to work has been ordered.

Zinc demand, although not impressive, has been a little better, and the United States price is still maintained at 11 c. per lb., New York. Figures published during the week show that United States production in February totalled 71,174 s.tons compared with 76,481 s.tons in January. Total shipments were lower at 66,490 s.tons compared with 70,941 s.tons respectively. As a result of this, stocks increased from 195,777 s.tons to 200,461 s.tons.

Closing prices are as follows:

	Mar. 5	Mar. 12
	Buyers	Sellers
COPPER		
Cash	£247½	£248
Three months	£247	£247½
Settlement	£248	£251
Week's turnover	11,750 tons	11,100 tons
LEAD		
Current ½ month	£71½	£71½
Three months	£73	£71½
Settlement	£780	£782
Week's turnover	8,075 tons	10,250 tons
TIN		
Cash	£779½	£780
Three months	£783	£783½
Settlement	£780	£782
Week's turnover	930 tons	1,230 tons
ZINC		
Current ½ month	£764	£762
Three months	£742	£742
Settlement	£758	£758
Week's turnover	9,500 tons	7,125 tons

Mining Finance

New Shaft for F.S.G.'s Rich Area

Free State Geduld is to sink a 22-ft. circular shaft approximately 4,000 ft. south of No. 1 shaft. The exact shaft site is not yet known, but it is apparent that its main purpose will be to speed the exploration of the area surrounding the pocket of extremely rich values, the discovery of which was announced by the chairman at the meeting in January.

The final depth of the shaft is as yet undetermined, so that to attempt any close forecast of the effect on profits during sinking would be premature. On the basis of similar shafts elsewhere, however, a round figure estimate of £1,000,000 is probably close enough for practical purposes. Sinking operations will probably not begin early enough to affect this year's estimated capital expenditure of £600,000 to any considerable extent, but it is certain that the period of heavy capital spending, which appeared to be nearing its conclusion, has still a few years to run. This is the case not only because of the new shaft, but also because with three outlets in commission, the opportunity is likely to be taken to increase the mill capacity to perhaps 140,000-150,000 tons monthly. Against this can be set the fact that the onset of tax liability, expected in 1961, will be deferred to some extent.

An interesting sidelight to the new announcement arises from the fact that a borehole is being drilled near the shaft site to obtain geological information. It was stated at the meeting that because of the zone's awkward geology, it would be a considerable time before the reef in the rich area was further tested. For this reason it was not expected that the April quarterly report would disclose any new values of interest. The borehole will strike the reef in an untested area, and although it is not known how far the drill has gone so far, it may well be that it will intersect the reef before any further underground exploration has been carried out. Not too much should be expected of this drill, however, as the shaft site may have been deliberately located sufficiently far away from the rich area to avoid locking up the bonanza ore in shaft pillars.

MARCH O.F.S. DIVIDENDS

The cost of the new shaft must have weighed in the minds of the F.S.G. directors when they considered the question of the March dividend, and for this reason the increase of 6d. over September's 3s. cannot be dismissed as disappointing. Indeed, 7s. 6d. probably represents the maximum which the company would have been prepared to distribute in 1959, without any question of a new shaft. There is obviously scope for substantial increases over this level once ore is coming from the rich areas, assuming they prove to be extensive.

The remainder of the Anglo American O.F.S. dividends declared this week are at best merely up to expectations, and at worst rather disappointing. One declaration in the latter category is that of Western Holdings, whose 3s. 6d. is 6d. below the September level. Nevertheless, the cut is more apparent than real, be-

cause on the interim-and-final basis preferred by this group, the dividend represents an improvement of 6d. compared with the corresponding 1958 payment, and probably portends an increase on the year.

This week's declarations are summarized below, together with the last three payments for comparison.

Company	Sept.	Mar.	Sept.	Mar.
	1957	1958	1958	1959
	s. d.	s. d.	s. d.	s. d.
F.S.G.	1 0	2 0	3 0	3 6
P. Brand	2 6	2 6	2 6	2 6
P. Steyn	1 6	1 3	1 3	1 3
Welkom	3	3	3	3
W. Holdings	3 0	3 0	4 0	3 6

ASHANTI'S "INADEQUATE" RESERVES

By any standards, an ore reserve virtually five years ahead of the mill is extremely strong. To call such an ore reserve "inadequate" seems almost ostentatious. In the case of Ashanti Gold-fields, however, the term is relative. At the end of the 1957 financial year

Ashanti recalculated its reserves on a revised basis to bring them more into line with the mining methods used. This resulted in a paper loss of 419,731 tons (the value, on the other hand, increased by 1.5 dwt.) and although 136,316 tons were added to the reserves in the 1958 financial year, the total is still not back to the 1956 level. To use the word "inadequate" in these circumstances is, therefore, no more than a measure of the stature of Ashanti, one of the richest mines of its size in the world.

In the current year there has been a setback to Ashanti's remarkable progress in the shape of a cracked winder drum at the recently-commissioned Eaton Turner shaft. This shaft was sunk in order to serve the bottom levels of the mine, where last year's development added 242,502 tons of 25.4 dwt. ore to reserves. These are the levels on which the future of Ashanti largely depends. This, however, was not as serious as it might have been. Production was little affected, and, with the installation of the new castings, it is hoped that an announcement may soon be made that the shaft is once more in commission.

With reserves so far ahead of the mill, the future at Ashanti is comparatively easy to forecast. The grade returned at the mill will not rise significantly for some time—until, in fact, ore is being stopped in quantity from the rich bottom levels. Capital expenditure on the other hand, is now falling off, so that there should be scope for a continued increase

(Continued overleaf)

LONDON MARKET HIGHLIGHTS

The Central African native unrest which had hung over the South African gold share market for most of the previous week produced a further bout of depression on Monday. Once again, selling was considered to be very light, but with buyers few and far between, Kaffir prices took a fresh plunge. In the final dealings faint signs of a recovery began to be noticed. But the strength of the subsequent rally on the following day took many dealers by surprise. No particular reason was put forward for the movement apart from the fact that it was overdue and that the Nyasaland news seemed no worse.

Free State Geduld dominated the market: the shares which on Monday had fallen to 148s. 9d., bounded ahead to close at 158s. 1½d. The rise was triggered off by news that another shaft was to be sunk in the south-western corner of the property, where the recent high development values were found. The accompanying F.S.G. dividend was considered to have been much in line with expectations as were the other Anglo American O.F.S. payments.

This was followed by a general marking up of prices throughout the list, gains in Eastern Rand Extensions (30s. 3d.) and Lydenburg Platinums (11s. 6d.) being inspired by the interest of these companies in Farm Vermeulenskraal, lying to the west of Harmony in the O.F.S.: Cape rumours suggested that drilling operations had been started on the property.

Copper shares emerged slowly from the pervading gloom. They were helped by the persistent strength of both metal and share prices in New York coupled with a gradual drying up of Continental

sales in London. Chartered (81s.) were a notably better market and Nchanga edged up to 10½. Buyers for Mangula (10s. 1½d.) appeared again at the Cape following the company's meeting in Salisbury, where mention was made of the benefits to come from the new smelter to be erected in Southern Rhodesia and also of the good progress made at the mine.

Small progress was made by tin shares, but one of the firmest was Tanjong, which on their good prospects rose to 17s. 6d. Investment inquiry persisted for Geevor (19s. 6d.) after attention had been drawn to the fact that this Cornish tin producer has assets of 16s. 3d. a share in cash and quoted investments.

Ashanti improved to 17s. 9d. in a rather subdued West African group on publication of the annual report with its news that the imminent resumption of hoisting at the new Eaton Turner shaft will be followed by a speeding up of development underground.

Interest flagged in the lead-zinc sections, despite the fact that as producers of silver as well as the base metals, many of these mines should benefit by the rise in the silver price. This quotation is now at its highest since May, 1957, and with industrial demand already good, the rise may have some further way to go yet, especially when it is remembered that the French need an estimated 30,000,000 oz. of silver for minting their new franc. Consolidated Zinc went ex rights to the new issue of one for six at 48s. But the new shares met with a poor reception from the market and soon fell from their initial 13s. premium to only 10s. 6d. premium. The old eased to 59s. x.r.

Rand and Orange Free State Returns for February

GOLD OUTPUT AND PROFIT

Company	February 1959				Current Financial Year Total to date				Last Financial Year Total to date			
	Tons (000)	Yield (oz.)	Profit (£000)	Year ends	Tons (000)	Yield (oz.)	Profit (£000)	Year ends	Tons (000)	Yield (oz.)	Profit (£000)	Year ends
Gold Fields												
Doornfontein	87	35,579	170.0	J	700	291,348	1505.4		683	281,884	1575.1	
Libanon	96	22,840	50.3	J	782	184,750	429.8		908	183,602	425.7	
Luipaards Vlei	67	12,210	4.6	J	557	96,814	43.0		573	102,497	59.7	
Rietfontein	16	4,252	7.9	D	32	8,600	16.7		45	10,358	29.2	
Robinson	64	12,862	127.9	D	130	26,972	142.2		143	30,540	12.6	
Simmer & Jack	84	16,791	8.0	D	174	33,991	18.2		169	33,278	29.9	
Sub Nigel	64	15,267	20.0	J	527	126,956	195.4		526	133,105	22.4	
Venterspost	125	31,631	55.9	J	1,017	253,926	464.5		963	233,247	441.0	
Vlakfontein	48	17,386	80.7	D	98	35,315	166.2		96	34,018	163.6	
Vogels	90	20,570	43.3	D	180	41,180	83.8		192	43,725	93.8	
West Drie	84	78,568	638.9	J	648	617,359	5044.8		600	575,964	4804.8	
Anglo American												
Brakpan	126	15,194	5.1	D	266	31,694	16.2		233	33,483	19.1	
Daggas	230	47,035	241.1	D	457	93,461	484.2		426	90,205	463.2	
East Daggas	92	15,355	26.1	D	183	30,465	53.2		174	29,006	49.8	
F.S. Geduld	75	57,335	418.0	S	369	277,332	2023.8		314	225,907	1555.3	
President Brand	95	72,584	603.3	S	480	362,296	3104.7		354	266,145	2135.9	
President Steyn	93	36,382	187.1	S	458	179,019	914.3		460	210,036	1042.7	
S.A. Lands	100	18,900	53.5	D	180	37,835	107.7		167	34,624	96.3	
Springs	99	13,740	8.2	D	203	27,960	18.2		245	27,369	14.3	
Vaal Reefs	78	35,495	195.1	D	156	70,986	395.1		131	58,717	334.6	
Welkom	90	27,762	75.2	S	450	136,631	382.5		403	119,467	320.7	
Western Holdings	100	60,304	461.9	S	496	293,417	2225.7		478	248,857	1811.9	
West. Reefs. Ex.	110	28,730	76.8	D	220	56,781	152.2		215	49,993	107.7	
Central Mining												
Blyvoor	108	70,987	511.2	J	839	551,155	3997.6		819	484,091	3432.4	
City Deep	107	22,366	9.1	D	224	46,812	21.2		215	54,160	19.2	
Cons. M.R.	110	19,050	12.3	J	1,107	161,144	115.1		1,294	179,657	78.6	
D. Roodepoort	203	32,286	7.1	D	435	68,112	16.1		446	68,227	32.3	
East Rand Prop.	175	32,232	49.6	D	365	66,926	103.4		350	63,002	97.9	
Harmon	201	52,000	103.1	D	424	109,169	228.7		427	109,533	285.0	
Modder East	102	40,920	154.3	J	798	320,510	1253.9		644	258,865	1272.4	
Rose Deep	127	12,221	2.0	J	1,068	105,231	16.9		1,087	109,781	21.5	
J.C.I.*	36	5,210	0.2	D	74	10,829	10.4		109	15,290	8.2	
E. Champ d'or	11	238	L26.0	D	23	522	L52.7		24	589	L53.1	
Freddie Cons.	53	13,594	L35.5	D	110	27,348	L70.3		92	31,194	L36.9	
Govt. G.M.A.	51	10,302	L5.9	D	115	21,260	L14.0		125	22,119	2.5	
Randfontein	28	4,673	8.1	D	57	9,481	14.2		203	8,266	10.1	
Union Corporation												
East Geduld	123	37,823	250.8	D	260	79,964	544.1		242	74,417	499.2	
Geduld Prop.	66	12,335	13.1	D	138	25,125	26.3		163	25,764	20.3	
Grootvlei	190	40,385	200.2	D	395	83,836	415.4		375	79,970	405.9	
Marievale	83	21,179	100.1	D	173	44,036	208.0		139	36,558	160.6	
St. Helena	135	40,507	215.6	D	275	81,248	426.9		226	66,940	360.0	
Van Dyk	71	13,394	20.1	D	149	28,089	50.1		148	26,172	38.3	
Winkelhaak	66	15,246	18.2	D	137	31,491	36.3		—	—	—	
General Mining												
Buffelsfontein	126	43,028	197.2	J	969	328,225	1503.0		876	286,556	1517.3	
Ellaton	30	7,091	30.1	D	60	14,170	60.2		62	14,125	66.0	
S. Roodepoort	28	6,762	21.8	J	238	56,472	189.5		235	55,282	201.0	
Stilfontein	127	64,770	418.3	D	252	128,645	835.7		215	106,787	746.4	
W. Rand Cons.	126	17,355	10.7	D	249	36,180	28.6		225	31,758	16.9	
Anglo Transvaal												
Hartbeesfontein	84	45,570	306.4	J	692	37,867	2550.2		679	372,615	2512.6	
Lorraine	75	14,625	L20.0	S	371	72,431	L92.8		309	59,429	L80.1	
N. Klerksdorp	10	1,060	L8.1	D	19	2,048	L16.5		20	1,913	L16.4	
Rand Leases	181	26,960	15.9	J	1,444	210,709	101.6		1,360	206,506	64.6	
Village M.R.	26	4,782	1.0	J	216	38,085	6.8		258	42,085	40.2	
Virginia O.F.S.	115	29,325	20.1	J	894	231,983	304.1		808	197,668	485.2	
Others												
N. Kleinfontein	78	10,167	2.5	D	162	21,171	6.0		180	22,185	1.0	
Wit Nigel	17	4,213	5.4	J	142	34,440	48.2		142	34,101	38.7	

Gold has been valued at 248s. 11d. (January 249s. 5d.) per oz. fine. L indicates loss. *Working Profit includes sundry revenue. Table excludes profits from Uranium, Pyrite and Acid, and also production from Uranium divisions at Luipaards Vlei, Randfontein and W. Rand Consolidated.

ESTIMATED URANIUM REVENUE

Company	Year ends	Feb. Profit (£000)	This year (cum.) (£000)	Last year (cum.) (£000)	Company	Year ends	Feb. Profit (£000)	This year (cum.) (£000)	Last year (cum.) (£000)
Gold Fields	J	14.0	119.0	174.0	J.C.I.	D	6.5*	12.8*	12.1*
Doornfontein	J	90.0	715.0	715.0	E. Champ d'Or(b)	D	32.0*	52.0*	52.0*
Luipaards Vlei (a)	D	48.0	100.0	104.0	Freddie Cons.	D	22.0*	44.1*	45.0*
Vogels	J	46.0	368.0	347.0	Govt. G.M.A.	D	107.2*	216.4*	220.2*
West Drie	D	141.2	285.2	273.0	Randfontein (a)	D	199.2	397.1	410.2
Anglo American	D	43.0	235.0	222.0	General Mining	J	204.0	1582.0	1035.0
Daggas	S	58.0	305.0	291.0	Buffelsfontein	J	259.0	2058.6	1864.9
President Brand	S	139.9	279.9	228.0	Ellaton	S	35.0	171.0	34.0
President Steyn	S	53.0	288.0	265.0	Stilfontein	D	90.0	180.0	174.0
Vaal Reefs	D	156.5	316.5	301.0	W. Rand Cons. (a)	D	199.2	397.1	410.2
Welkom	S	1224.4	(c)		Anglo Transvaal	J	259.0	2058.6	1864.9
West. Reefs Ex.	J	162.6	1167.5	(c)	Hartbeesfontein	J	259.0	2058.6	1864.9
Central Mining	J	153.7	(c)		Lorraine	S	35.0	171.0	34.0
Blyvoor	J	162.6	1167.5	(c)	N. Klerksdorp	D	10.5	20.5	27.0
Harmony	J	162.6	1167.5	(c)	Virginia O.F.S.	J	176.2	1476.9	1485.8

Table includes profit from uranium, acid and pyrite before loan redemption. (a) Total profit from uranium section. (b) Overall profit. (c) Figures not available. *Net after provision for replacements and loan repayments.

MINING FINANCE—Continued

in the amount distributed. By the time that this source is being fully utilized, the grade should be at a high enough level to provide a further increase in dividends. With these facts in mind, the current price of 17s. 9d. (to yield over 11 per cent excluding the bonus) looks quite cheap, even allowing for the political factor which must always play some part in "Jungle" investment policy. Major General Spears, the chairman, will probably deal with this aspect in his speech to Ashanti's meeting on April 1.

CAN BIBIANI BE SAVED?

Ashanti's stablemate, Bibiani, is a horse of quite a different colour. Whereas Ashanti, 60 years old, is showing no signs of ill health, Bibiani, half that age, is an old mine. Its future—or, indeed, the question of whether it is to have a future—depends on the discovery of major new orebodies.

Exploration in promising areas has been pushed ahead with all possible speed, but results so far have not rewarded the management's efforts. Useful tonnages continue to be discovered, but during the 1958 financial year the reserves were eroded to the extent of over 300,000 tons, about nine months' mill supply from a total reserve equivalent to about 2½ years' supply at the end of the year.

It must be borne in mind, however, that Bibiani has a source of ore apart from the reserves, namely the South and Central quarries. It is not known how much ore remains in the South quarry, nor, indeed, what sort of tonnage the so far untouched Central quarry contains, but last year the South quarry supplied more than one-fifth of the mill's requirements.

With this picture of declining ore supplies, and therefore declining profits, in mind, the present yield on the shares of about 16½ per cent is certainly not overgenerous.

COPPER SMELTER FOR S. RHODESIA

Erection of a copper smelting and refining plant at Alaska, S. Rhodesia, by a new company, the Messina Rhodesia Smelting and Refining Co., is to begin immediately. The primary purpose of the plant will be to provide fire-refining facilities for the concentrates produced by M.T.D. (Mangula) and other Southern Rhodesian copper properties as and when they are brought to production by Messina (Transvaal) Development Co. There will also be custom facilities for other copper mines. It is estimated that the plant will be in operation within 18 months.

Messina Rhodesia Smelting will have an issued capital of £750,000, of which £600,000 will be provided by Messina (Transvaal) and the remainder by M.T.D. (Mangula). Alaska is only 45 miles from Mangula, and the plant will be sited adjacent to the railway.

This is an event of the utmost importance to M.T.D. (Mangula). The obvious advantages are the assurance of smelting and refining capacity; the ability to market a more easily saleable product than the present 50 per cent concentrates; and the saving in freight

and realization charges. In addition, by agreement between Messina and the Southern Rhodesian Government, M.T.D. will be exempt from the payment of royalty, while the holding of a one-fifth interest in the new company's equity may be a useful source of income, should the custom facilities be used to any extent.

Another item of good news from M.T.D. is that the second Aerofall mill has been installed on schedule, and that as soon as the initial testing period is over mine output will be increased to the planned level of 3,000 tons daily. This was announced by M.T.D.'s chairman, Cdr. H. F. P. Grenfell, at the company's meeting on Wednesday. Extracts from his speech appear on this page.

INTERESTING OUTLOOK FOR FALCON

Falcon Mines' profitability depends almost entirely upon the Dalny Mine. True, gold is still being produced at the Sunace and Bay Horse mines, but the ore at Sunace is virtually exhausted, and although Bay Horse will continue to contribute to profits by re-treating dump material with plant moved from Sunace, the development programme at this mine is almost complete. The Falcon mine has been closed for four years.

In October, 1958, additional units of plant were added to the Dalny mill in order to compensate for the declining income from the other two properties. This policy has proved extremely successful, and Dalny's working profit has risen from £97,724 in 1956-57 to £130,569 in the year to September 30 last. This, of course, was more than enough to offset the decline in earnings from the other mines, and Falcon's profit for the year increased from £103,685 to £136,653. Falcon will pay no tax for perhaps ten years because of capital expenditure allowances.

Falcon is thus at an interesting stage of its development. As long as development at Dalny continues to be reasonably satisfactory, the company's distributable profit should stabilize at around £120,000 now that a steady 20,000 tons per month are being put through the mill. This would give scope for raising the dividend perhaps five points above the 17½ per cent which has obtained for the past four years.

Falcon shares currently stand at about 7s. 6d. to yield almost 11½ per cent on last year's dividend, which was covered 1.7 times. This is certainly not dear.

As we go to press, Falcon have announced an unchanged first interim for the current year of 4½d. per share.

ANGLO-FRENCH LOOKS CHEAP

At current prices, an investment of £1 in Anglo-French Exploration Co. buys something like 24s. worth of an excellent portfolio, based largely on young gold mines but with leavening of sound base metal producers and oil companies. Couple this with a yield of over 6½ per cent, and the result is a mining finance share which looks distinctly cheap.

Anglo-French's profits in 1958 showed the expected advance over the previous year's earnings, in spite of the lower dividends received from the base metal producers, and there is no reason why this trend should not continue. In fact, it should gather momentum as base

metal dividends revive and the underlying securities of such companies as Ofsits and Union Corporation progress into, or further into, the dividend-paying stage.

One sign of confidence in the future is the fact that although the 1958 distribution was unchanged at 1s. 10½d. (which, in fact, represents an increase of 11 per cent in distributed profits because of a rights issue at par) it is proposed to begin paying interim dividends with a first distribution of 6d. next September.

INDIA IS NOT OUT OF THE WOOD

On pages 294 and 295 appear the chairmen's statements of two of Britain's overseas banks, National and Grindlays Bank and the Chartered Bank. It is, of course, organizations such as these that finance British exports to some of the most difficult of world markets.

The perennial thorn in the side of these two organizations is India. That country's economy seems to exist in a perpetual state of semi-crisis, and from time to time such events as a poor monsoon or the Mundhra affair and the subsequent resignation of Mr. Krishnamachari seem to be near to providing the last straw.

This year, however, both chairmen are able to tell a slightly happier story. Last March the situation looked alarming; it seemed certain that the import programme, linked with the 1956 industrialization drive, was far outstripping both India's own resources and the extent of foreign aid likely to be forthcoming. The position was aggravated by the weakening of world commodity markets, in particular that for jute.

September's tour by India's Foreign Minister saved the day temporarily at least. The battle is not yet won, however, because the aid raised by the minister will have to be repaid and this is going to strain the balance of payments once more in the years to come. The informed views of the bank chairmen on possible remedies make interesting reading.

British Oxygen.—Available profit after taxation in 1958 attributable to the British Oxygen Co. amounted to £2,876,208, a record. The 1957 figure was £2,440,000. A final dividend of 6 per cent is proposed, making an unchanged total of 10 per cent for the year. Meeting, March 25.

M.T.D. (MANGULA) LTD. (Incorporated in Southern Rhodesia)

FIRST YEAR OF PRODUCTIVE OPERATIONS

BRIGHTER OUTLOOK FOR COPPER PRICES

COMMANDER H. F. P. GRENFELL ON PROMISING BEGINNING

The twelfth Annual General Meeting of Stockholders of M.T.D. (Mangula) Limited was held on March 11 in Salisbury, Southern Rhodesia. Commander H. F. P. Grenfell, D.S.C., R.N. (Ref'd.) (the Chairman), presided and, in the course of his speech, said :—

Ladies and Gentlemen,

On September 17, 1957, the first Aerofall Mill unit was brought into operation, almost exactly two years after the construction programme was begun under the direction of The Messina (Transvaal) Development Company Limited, and from October onwards, regular sales of concentrates have been made to refineries overseas.

Very Satisfactory Results

The accounts now presented to you reflect, therefore, the first year's productive operations by your Company, and when one takes into account the teething troubles which are inevitable during the first year of a mine's operations; the fact that only one unit of the Mill was in commission; and the low level of copper prices; the resultant profit of £3,740 may, I think, be considered very satisfactory.

The average price for the twelve months covered by the accounts was approximately £186 per ton.

However, since then there has been a welcome recovery, and with the end of the recession in the United States and the removal of trade restrictions on unwrought copper and other non-ferrous metals between Western European countries and those behind the Iron Curtain, prospects are considerably brighter than they were this time last year.

The copper market has always been

sensitive to outside influences, and fluctuations in prices either way are bound to occur from time to time, but broadly speaking the picture, as I see it, is one of steady progress towards higher levels.

The Year's Operations

During the year the mill handled approximately 495,000 short tons of ore, and operating costs amounted to 27/8d. per ton of ore treated. A total of 10,700 short tons of concentrates averaging nearly 52% copper was produced, the equivalent cost figure being £64 per short ton. Realization charges amounted to £24,10.0. per ton, and the overall cost was therefore £88,10.0. per short ton of concentrates. Taking all factors into consideration these costs are very creditable for the first year of production.

The second Aerofall Mill unit has now been installed, extensions have been made to the Flotation Plant, and as soon as the initial testing period is over, output from the mine will be increased to its planned production of 3,000 short tons of ore per day.

On this scale of production, working costs will also be substantially reduced and I do not expect them to exceed 22/- per short ton of ore once the mine has settled down on a routine production basis. As the output will have been at the lower rate for the first half of the financial year, however, the full benefits of increased production will obviously not be experienced until next year, although even this year there should be a substantial improvement.

Ore Reserves

There was an increase in ore reserves of about 1½ million tons after allowing

for the year's production. This can be considered satisfactory because, for reasons of economy, underground development in the Molly Section was greatly reduced.

For the same reasons field work and exploration elsewhere on the property were also kept to a minimum, but now that the future looks more promising, underground development will be increased, and as funds permit, we shall continue our search for additional ore deposits within our Exclusive Prospecting Area.

We have already obtained promising indications by geochemical surveys in several parts of the property, and on one of them—in the Norah area—a small prospect shaft has been sunk and some development carried out underground. At a depth of 150 feet we have exposed two parallel ore bodies of which one, about 30 feet wide, averages 1.86% copper over a strike length of 600 feet. Development is still incomplete but we have good reasons for hoping that we may discover further ore bodies of a similar nature over at least another 2,000 feet to the north. The Norah area, as you may remember, is situated about 4½ miles south of the Molly Section, along the new road to Zawi, and if we are successful in finding new ore bodies there, transport to the Mill will be quite a simple matter. However, we have by no means arrived at that stage yet, and at the moment I would prefer to describe Norah as a promising prospect.

Participation in New Company

There is one other very important matter with which I must deal before concluding my speech. You will have seen from a recent announcement in the Press that our parent Company, The Messina (Transvaal) Development Company Limited, is to proceed immediately with the erection of a Smelting and Refining Plant adjacent to the railway at Alaska, and only 45 miles by road from Mangula.

A new Company—The Messina Rhodesia Smelting and Refining Co. Ltd.—is to be formed with an initial capital of £750,000 of which a participation of £150,000 has been offered to your Company. In view of the undoubtedly advantages—to which I will refer in a moment—which will accrue to your Company, your Board have had no hesitation in accepting this offer and in agreeing to enter into a long term contract for the treatment of the whole of the output from the mine.

The chief benefits will be as follows. First, your Company will always be assured of smelting and refining capacity for its output; second, it will be able to market a more saleable product in the form of fire-refined ingots; third, there will be a substantial saving in freight and other charges as compared with present arrangements; fourth, by agreement between the Government of Southern Rhodesia and the parent company, your Company will be exempt from the payment of royalty; and finally, by accepting a participation in the capital of the Smelting and Refining Company, your Company will share pro rata in its profits.

This brings me to the end of my review—and I can best sum it up by saying that your Company has made a promising beginning under difficult conditions, and that I have no doubt that it has before it a successful future.

The report and accounts were adopted.

NATIONAL AND GRINDLAYS BANK

A SOUND BUSINESS

The annual general meeting of the National and Grindlays Bank Ltd., will be held on April 7 in London.

The following are extracts from the statement of the Chairman, Mr. J. K. Michie, circulated with the report and accounts :

The total of our balance sheet at £151,491,479 shows a reduction of £10,613,741 on the amalgamated figure for the year 1957. Our net profit is also lower by £55,783 at £271,707, arrived at, as usual after providing for taxation, for bad and doubtful debts and for other necessary reservations. Two interim dividends of 7½% have been declared the total distribution, therefore, being unchanged at 15%.

The reasons for the smaller profit figure are several. One which will be non-recurring is the inescapable expenditure in connection with the amalgamation which though limited by all possible means was still considerable. Then, apart from the ever increasing competition which is a feature of banking in the East and in East and Central Africa in some cases from growing indigenous banks and in others from new entrants in the field, or from both, in none of our territories were conditions more favourable for bankers and in most they were more difficult than in recent times.

On the other side of the slate British Government securities staged a considerable rise during the year and our inner reserves have benefited in consequence. Incidentally, it has been and still is the policy of the bank to meet out of current income depreciation in the values of what can be termed "local" securities held by branches but we do not "write up" such securities should they appreciate but leave the reserve untouched until realization or maturity.

India

At this time last year India was facing a critical balance of payments situation which I am glad to say has been at least temporarily resolved partly by her own exertions and by the aid obtained from the World Bank and various Governments, including our own. There are still hurdles ahead but I think there is justification for believing they too will be cleared and that when many of the larger capital projects now being financed come into operation the present difficulties in this respect will lessen.

Nevertheless, food production must continue to be the fundamental problem of countries like India which have both a low average standard of living and a rapidly growing population, and one cannot help being a little doubtful if agriculture gets its fair share of attention vis-à-vis industrialization.

Because of the international recession in textiles India's exports of finished goods have fallen to 70% of the 1957 figure. Jute, too, has had a depressing year with continuously falling prices. Tea exports on the other hand have risen appreciably.

Last year I commented on the paradox that in India money was simultaneously scarce and cheap. Now it is not quite as scarce—but despite the relative financial situations of the two countries lending rates remain much on the same level in India as in this country and of course

they never reached the heights in India which they did here when our Bank rate was at 7%.

The balance of payments position resulted in a distinct reduction of the amount of overseas business flowing through normal banking channels in 1958 and in consequence the exchange side of banking was and still is adversely affected.

Pakistan

Very strict measures of currency and other controls have been instituted and the Government claims that already the balance of payments position has improved materially. The Government also proposes to introduce very far reaching changes in the ownership of land which it is hoped will lead to higher yields of agricultural produce which since Pakistan became a separate country have undoubtedly been disappointing particularly in good grains.

Swinging increases in import duties mainly on what are regarded as luxuries have recently been announced, some of which will particularly affect European residents. In January the State Bank of Pakistan raised its rate from 3% to 4% a level which cannot be regarded as too high.

Liability for Uncalled Capital

At present this is 7s 6d per £1 share and the fact that there is such a liability undoubtedly narrows the market for your shares and we know has exercised the minds of some of our shareholders.

The question of arranging for the elimination of the disability and the method to be used has been engaging the attention of the Board and it is their intention to place proposals before you in the near future. However, the Board also consider it right to let you know that unless a higher level of income eventuates than they now foresee they would not consider it prudent to recommend any increase in the amount paid out in dividends.

General

Since I last addressed you a metamorphosis has happened in the financial affairs and standing of this country and of the pound sterling bringing with it two outstanding results—the gold and dollar reserves at the end of December had moved up to £1,096 million, which compares with £660 million to which they fell in September, 1957, and the Bank of England rate has fallen to 4 per cent. from 7 per cent. current a year ago.

That these manifestations of improved economic health spell security is neither the belief of the Chancellor of the Exchequer nor of any unbiased person, but at the lowest assessment they mean that we have ridden the storm more successfully than was hoped or feared and that given no major setbacks in world trade or world politics we are on the road to better things. What these may be must await, amongst other things, the Budget. As to our own immediate future we have a sound business and a good and loyal staff to whom we are again beholden. Although, as I have told you, we have difficulties to contend with, some of which are new and unpalatable, I am sure that we shall as in the past surmount or adjust ourselves to them.

THE CHARTERED BANK

FURTHER EXPANSION OF BUSINESS

AID FOR NEWLY INDEPENDENT NATIONS

MR. V. A. GRANTHAM ON COMMON MARKET PROBLEMS

The 105th Annual General Meeting of The Chartered Bank will be held on April 1 at 38, Bishopsgate, London, E.C.2.

The following is an extract from the statement by the Chairman, **Mr. V. A. Grantham**, which has been circulated with the report and accounts for the year 1958 :

The Bank's Balance Sheet

The accounts indicate a further expansion of the Bank's business. The total of our own balance sheet at £243,118,186 is some £11,500,000 up on last year's figure which was itself a record.

Current and Other Accounts show a slight reduction of £2,032,672 which is more than offset by a substantial increase in Fixed Deposits of £15,994,119. Our acceptances are lower by £2,778,353.

On the assets side Cash in Hand at Call and at Bankers' Government and other Securities and Bills of Exchange show increases of £1,324,674, £10,402,781 and £5,848,798 respectively and evidence of a strong degree of liquidity. The ratio of cash and call money to our demand and time liabilities, excluding the notes in circulation against which security has been lodged, is slightly lower at 22.1% against 22.9% last year. Advances to Customers and Other Accounts show a contraction of £3,975,323.

The increase in the net figure for Bank Premises and Furniture is due to our continued expansion and the modernization of our properties in the East.

The Consolidated Balance Sheet includes the figures of all our wholly owned subsidiaries and the total at £285,430,502 is £13,532,487 higher than last year.

Consolidated Profit and Loss Account

The continued upward trend of working costs, especially salaries and wages, in conjunction with a lowering of interest rates during the period under review has resulted in a decrease in our net profits from £1,000,890 in 1957 to £993,590.

In October last the issued capital of the Bank was increased to £5 million by the capitalization of £600,000 out of the Reserve Fund and £400,000 was restored to the Reserve Fund by a transfer from Reserves for Contingencies Account.

The Bank paid an interim dividend of 7½% less income tax in September last on £4,400,000 capital, absorbing £189,750 and it is now proposed that out of the balance available a final dividend of 7½% be paid on the increased capital of £5 million costing £215,625.

We have allocated £250,000 to Bank Premises and Furniture and £125,000 and £20,000 respectively to the Pension Fund and Widows' and Orphans' Fund. We have transferred £150,000 to Reserves for Contingencies and the balance carried forward is £481,673.

The Irano British Bank

Our acquisition of the share capital of the Eastern Bank gave us a direct interest in the Middle East, and our assessment of the political, and economic situation there convinced us that our representation would be incomplete without an interest in Iran. We were pleased, there-

fore to have an opportunity of joining with influential Persians in promoting a joint banking venture in their country. The authorized capital of the Irano British Bank is Rials 200 million, of which Rials 100 millions have been subscribed and paid up. We have subscribed 8,000 shares of Rials 10,000 each and the Eastern Bank 1,800 shares of a similar denomination, which gives us 49% of the capital of a bank which has now been registered and granted a banking licence in the above name.

This bank will have as its General Manager an officer seconded from our Eastern covenanted staff and it will open for business in Tehran on March 10, 1959, and later in Khorramshahr. It is pleasing to note that the return of British banking interests has been generally welcomed and we hope that this new joint venture bank, by bringing experience and knowledge to the handling of imports and exports, will assist the country in its trade expansion programme.

Representation in Birmingham

We have felt for some time past that the revolution which has taken place in the United Kingdom export trade since the end of the war necessitated our establishing closer contact with the new exporting industries in the Midlands. It has been decided therefore to appoint a representative of the Bank and its subsidiaries and associates to reside in Birmingham and to set up there an organization which will facilitate more extensive participation in the financing of exports of Midland manufactures to the Asian markets in which we, The Eastern Bank Ltd. and The Irano British Bank, are established.

Mr. A. M. R. Currie, until recently our Manager in Indonesia, has been appointed to the post and he will take up his duties during the month of April. It is not proposed, at present, to open a branch of the bank in Birmingham; the new office will be equipped to import economic and credit information and to serve as a link between the export trade of the Midlands and Head Office.

Overseas Survey

Two recent events, the extension of sterling convertibility and the inauguration of the European Economic Community or Common Market are of considerable significance to us in our business as an international bank.

For the first time since before the second world war sterling earned from commercial transactions by residents outside the sterling area, is convertible, without restriction, into gold, U.S. dollars, or any other currency. Other European countries have taken parallel steps in dismantling the formidable array of exchange control regulations established in wartime. That it has proved possible in the case of sterling is a tribute to the efficiency of the stringent measures which were necessary as recently as September, 1957, in order to restore confidence in sterling as an international currency and the medium of 40% of the world's visible trade and a large proportion of its invisible transactions.

The increased scope of convertibility, by inducing confidence, should encourage

the wider use of sterling by countries which are outside the sterling area such as Japan and the Philippines, in our own sphere of operations, and there should be a greater readiness for those countries to accumulate and hold sterling. The Philippines, for example, are amending their monetary laws to allow currency reserves to be so held.

I have, on previous occasions, stated that it is still insufficiently appreciated that the City of London's oversea earnings in respect of its banking, merchanting and other services comprise a substantial proportion of the United Kingdom's invisible income. Without that invisible income the country would be unable to afford the trade deficit which it habitually runs. Moreover, the City's oversea earnings involve very little expenditure of foreign exchange.

Free Trade Area Impasse

The second event which calls for comment is not so promising for the Chartered Bank and its associates, which engage primarily in the financing of oversea trade. I refer, of course, to the impasse which has been reached in the negotiations for the setting up of a wider free trade area to supplement the newly established Common Market and it is by no means clear that the European Economic Community (E.E.C.) will not detrimentally affect the trade position of a number of Asian countries in which we operate.

In theory, the increased scale of industrial operations possible in a unified market of some 170 million people should lead to an increase of trade with the outside world, but many of the Asian countries fear that the establishment of E.E.C. may mean the creation of a new system of tariff preferences within Europe which will have the opposite effect.

In general, it is possible that these fears are exaggerated for the agricultural exports of the South East Asian countries differ generally from those of the French and Belgian African territories which receive preferential treatment, and for manufacturing countries like India and Hong Kong imperial preference is still the most important factor in their trade. Nevertheless, it would be a very retrogressive step if South East Asian countries had to resort to bilateral agreements with the Common Market, and it is to be hoped that for the sake of Asia as well as the United Kingdom a formula will be found to extend the present E.E.C. to the envisaged free trade area.

India

At one stage during the past year there seemed a grave danger that the import programme sanctioned soon after the inception of the plan in April, 1956, had not only outstripped India's ability to finance it but also the extent of the foreign aid that was likely to be forthcoming. Fortunately, following the Finance Minister's foreign tour last September, he was able to secure sufficient credits to meet India's shortage of foreign exchange until next March, and possibly to March, 1961. Moreover, it is generally understood that arrangements are in hand for the provision of enough foreign assistance to complete the essential features of the plan, which suggests that the worst of the crisis may be over.

Unfortunately the extent to which the Government has resorted to deferred payments has left a burden, to be shouldered in the years to come, which will leave little margin for additional foreign

exchange expenditure during the third five-year plan, even allowing for possible savings on exchange which are likely to accrue when the new steel works and heavy industries, set up under the present plan, commence operations.

It seems to me that India has to accomplish two things in order to safeguard its future: firstly, and this applies equally to Pakistan, it has to improve its relations with its neighbour to an extent that the proportion of military and other Service expenditure in its budget is so drastically reduced that a lowering of taxation is possible. Secondly that the gold in the hands of the people be made available to the Government. This is a psychological problem depending on confidence but it might be possible to introduce a form of bearer loans against gold, or even free imports, and allow an economic rate to be found and confidence restored in that way. Success in this could go a long way towards solving India's foreign exchange problem.

The widespread publicity given to India's difficulties during the past year or more should not be allowed to obscure the extensive progress that has been achieved in carrying out the country's development programme. The task of improving the living standards of a population of some 400 million, which is increasing by about five million each year, is obviously immense and it is greatly to the credit of the Indian Government that it has chosen to implement its five-year plans by democratic means.

Pakistan

The new regime has acted with energy to effect an improvement in the country's circumstances. Although at first there was some confusion in business circles because of the many regulations fixing prices and limiting profits and dividends, the authorities have shown a commendable spirit of compromise and a general soundness of judgment in the introduction of new measures. It is pleasing to see that national effort is to be concentrated on the agricultural sector of the economy, on which the country's prosperity will depend for many years to come, and when Pakistan can again feed its population and stop the large imports of food-grains which have entailed such heavy outlay of foreign exchange in the last few years, then a great step forward will have been taken towards restoring equilibrium to the national economy.

It is fair to say that Pakistan enters 1959 in circumstances more hopeful than for some years past.

Conclusion

The oversea territories in which we operate are receiving increasing publicity and it is generally recognized that the developing of the natural resources of the South-East Asian countries and the raising of the standard of living there is of vital importance to future peace and progress in the world. This challenge is being accepted by the Western Powers in a most understanding and generous manner and the extent to which aid and credit is given to the newly independent nations of the area is staggering.

Very few of the countries concerned would survive economically were it not for the tremendous infusion of assistance they receive and one can only hope that wise counsel and incorruptibility within these countries and a tolerant direction from the donors will help attain the objective of self-supporting economies with ever increasing exports.

This objective cannot be reconciled with a Western fear of Asian competition and attempts to avoid this competition and, in this connexion, perhaps too little significance has been given to the attitude of the United Kingdom Government in acquiescing in limitations on the textile shipments from Hong Kong to the United Kingdom.

Copies of the full text of the statement will be sent on application to the Secretary of the Bank at 38, Bishopsgate, London, E.C.2.

FALCON MINES

The forty-ninth annual general meeting of Falcon Mines, Ltd., will be held on March 31, at Bulawayo, Southern Rhodesia.

The following is an extract from the Statement of the Chairman, Mr. F. L. Wigley, dated February 17, 1959, circulated with the Report and Accounts for the year ended September 30, 1958:

The net profit for the year was £136,653. The sum of £60,000 has been appropriated for expenditure on fixed assets and mine stores. After providing an amount of £560 for Northern Rhodesia Territorial Surcharge Tax in respect of the M'tuga Tribute and for dividends Nos. 9 and 10 totalling 10½d. per share (17½ per cent.), which absorbed £79,433, there remained a balance unappropriated of £12,601 compared with £15,941 brought forward from last year.

Dalny Mine

At the Dalny Mine, the new reduction plant units were brought into operation in October, 1957, and the rate of tonnage milled was raised gradually to about 20,000 tons per month. Your Board is satisfied with the results obtained from the treatment of the additional tonnage, having regard to the mechanical and metallurgical difficulties which followed the starting-up of the new plant.

Working costs have been reduced during the first four months of the current financial year following the improvement in operating conditions but it will not be possible to maintain this reduction if a recently proposed increase in the electricity tariff is assented to by the Electricity Council. The new tariff would have the effect of increasing working costs by about eightpence per ton milled as from February 1, 1959.

The estimated ore reserve at September 30, 1958, was 572,600 tons valued at 4.42 dwts. over a width of 97 inches, an increase of 36,300 tons and 0.1 dwts. per ton in value as compared with the previous year. The year's development results were satisfactory, the percentage payability and average value of the footage sampled being well maintained. The crosscut north from the 7th level, Dalny Section, reached the Pixy Reef area in September, 1958, at a point some 1,000 feet west of No. 2 borehole. This borehole, as mentioned in the Chairman's Review for 1956, intersected an ore-body assaying 33 dwts. per ton over a true width of 92 inches at a vertical depth of 425 feet. The crosscut intersection was made in disturbed ground and the area is now being explored by development and diamond drilling. To assist this exploration, a shaft has been sited and sinking from the surface has commenced.

Coming Events

The International Mineral Processing Congress, 1960, which is being arranged by the Institution of Mining and Metallurgy, will be held from April 6 to 9, 1960, at Church House, Westminster, London, S.W.1. Papers will be discussed under the following main groups: comminution; classification; flotation research; flotation practice; gravity and heavy-media separation; magnetic and electrical separation and sorting; chemical processing; process study; control and testing; and plant control and layout. The organizing committee has already dealt with over a hundred offers of papers. A preliminary programme will be issued later this year. *

The Northern Management Conference will be held at Southport from April 2 to April 4. *

The annual dinner of the Institution of Mining and Metallurgy will be held in the Hall of the Grocers' Company, Princes Street, London, E.C.2, on Tuesday, May 5, 1959, at 7 for 7.30 p.m.

DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH: GEOLOGISTS: At least 7 pensionable posts in Geological Survey for men and women aged 21 and under 30 (31 for permanent members of Experimental Officer Class) on 1.7.59, extension for regular Forces Service or Overseas Civil Service. Candidates should normally have (or obtain in 1959) First or Second Class Honours degree in Geology. Some posts require special qualifications in mineralogy and petrology and one will involve short-term overseas field investigations on radioactive mineral deposits. Men's salary £635-£1,120 (national). Provision for starting pay above minimum. Promotion prospects. Write Civil Service Commission, 17 North Audley Street, London, W.1, for application form quoting number S168/59. Closing date, April 14, 1959.

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PETALING TIN

MR. J. T. CHAPPEL'S VIEWS ON RESTRICTION

The Thirty-third Annual General Meeting of Petaling Tin, Ltd., was held on March 6 in Ipoh.

Mr. J. T. Chappel, C.B.E., M.I.M.M., the Chairman, presided.

The following is his statement, dated January 29, which had been circulated with the Report and Accounts for the year ended October 31, 1958:—

The nett profit of \$209,945 (£24,493), after due allowance for depreciation and property redemption, shows a slight increase over that of the previous year. Capital expenditure during the year included a further \$262,719 (£30,650) on the deviation of the Klang River in the Puchong Area and an instalment of \$172,197 (£20,000) for the purchase of 595 acres of Castlefield Estate. The Company's contribution to the Tin Buffer Stock during the year amounted to \$222,042 (£25,905). In consequence, the Bank overdraft was considerably increased, as the use of these facilities continues to be preferable to the sale of any of the Company's holdings of dated securities. The overdraft is now being progressively reduced.

The General Managers' report states that Nos. 3 and 4 Dredges were closed down in April owing to the high degree of restriction imposed under the Tin Control Regulations. An alternative area for the operation of No. 5 Dredge is being investigated, but there is nothing definite to report at this stage. No. 6 Dredge is now producing in excess of quota at the current low rate, and consequently returns are much more satisfactory. The deviation of 1½ miles of the Klang River has been completed and, apart from a short period when No. 6 Dredge will enter tailings to cross the new river channel, satisfactory production may be expected from this unit for several years to come.

The Company's Assessments in respect of Nos. 6, 4 and 3 Dredges total 26,191 piculs, and in addition to the quota arising from these Assessments, the Company is now receiving a small share of additional quota under profit sharing arrangements within the Group under the same general management.

Good relations have been maintained with the labour force, and I would pay tribute to them and the Staff for the efficient manner in which they have carried out their duties under trying circumstances due to Tin Export Control.

Government's Important Proposals

It is now well over a year since Malaya achieved the status of an independent nation, and under the present stable Government the affairs of the country continue to be administered on sound lines, although the increase in the Company Tax from 30% to 40% in the Budget for 1959 is disappointing, particularly in view of Government's declared policy of maintaining a favourable tax position in order to encourage private enterprise.

Government is rightly paying much attention to proposals for the country's future development, and in this connection the publication last June of the Report of the Land Administration Commission is of the greatest importance. The attention of all those interested in the economic future of the country, and particularly of the Mining Industry which plays such an important part in

the Malayan economy, is drawn to Part VII of the Report which stresses the necessity for priority for applications for mining. Although the Industry is at present suffering from the effects of over-production, there is little doubt that, taking a long term view, the world will require all the tin that can be produced, and all those with the interest of Malaya at heart will hope that everything possible will be done to maintain the country's position as the world's largest producer of tin.

Limitation of Exports

In my statement last year I referred to the introduction of export control by the International Tin Council, which limited the total exports of the six producing signatory countries to the International Tin Agreement to a total of 27,000 tons for the first control period, December 15, 1957, to March 31, 1958. The total permissible exportable amount in the second and third quarters of 1958 was reduced to 23,000 tons, and was further reduced to 20,000 tons in the fourth quarter, this rate being continued in the first quarter of 1959. As a result there have been progressive reductions in the authorized deliveries in Malaya, and for the current quarter the amount for European producers is only 42.93% of one-quarter of the individual producer's assessment.

Notwithstanding the heavy curtailment of exports by the six producing countries, the Buffer Stock now holds 23,500 tons of metal. There is also an undisclosed tonnage held by the Buffer Stock Manager on account of the Special Fund raised last year, when it became apparent that the funds available in the Buffer Stock were insufficient for the purpose of maintaining the price of the metal on the London Metal Exchange at the floor price of £730 per ton. This very unsatisfactory position was mainly due to large dumping of tin on the world market by Russia, estimated to have been in the region of 18,000 to 20,000 tons in 1958, believed to arise as a result of imports of very substantial quantities of tin concentrates or metal by Russia from China.

Following the withdrawal of support of the floor price by the Buffer Stock Manager in September last there was a drastic fall in the tin price to £640 per ton, but it soon recovered and has been comparatively stable during recent months in the region of £760 per ton.

Russia's Intention

During the last quarter of 1958 some of the major consuming countries, who are signatories to the International Tin Agreement, led by the United Kingdom, imposed import restrictions on Russian Tin. After a meeting of the International Tin Council early in November, it was announced that the Council was unable to accede to a request made by Russia to become an observer at the Council, following Russia's refusal of an invitation to become a signatory to the International Tin Agreement. The Chairman stated, however, that he had reached agreement with the Soviet authorities "on the principle of co-operation".

Following the next meeting of the International Tin Council in mid-December, it was stated that negotiations with Russia were expected to be completed before the end of the year. On January 26 it was announced that an understanding had been reached between the Head of the Trade Delegation of the U.S.S.R. in the United Kingdom and the Chair-

man of the International Tin Council regarding exports of tin from the U.S.S.R. during 1959.

The statement added: "The U.S.S.R. has confirmed her intention to reduce her tin exports to countries outside the Communist bloc in 1959 as compared with exports in 1958. In the final answer given to the Council the Soviet Foreign Trade Organization has said that it is their intention to consider a figure of 13,500 tons as the limit of such exports. In view of this undertaking the United Kingdom, the Netherlands and Denmark have agreed to lift the import restrictions on Russian tin which were imposed as an emergency move last year".

That is the present position, and it remains to be seen how the U.S.S.R.'s expressed intention will be carried out in 1959, and whether a satisfactory arrangement can be negotiated covering exports of tin from Russia thereafter. It also remains to be seen whether there will be any diversion of Chinese exports from Russia directly on to the world market.

A Weakness to be Rectified

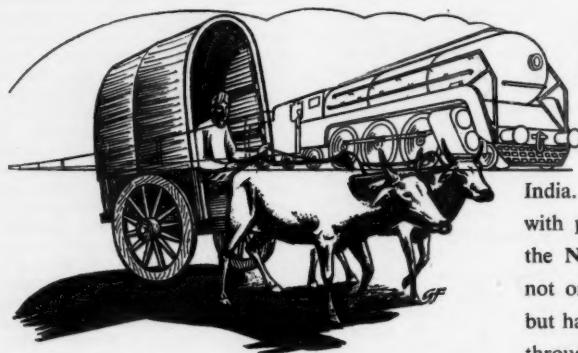
The events of the past year have shown a serious weakness in the operation of the International Tin Agreement, in that non-participating countries such as Russia and China have been in a position to sell unlimited quantities of the metal at prices only maintained by drastic curtailment of exports by the signatory producing countries. In my view it is essential that this position should be rectified, as Malayan producers cannot be expected to continue indefinitely the current heavy restrictions on their sales of tin in order to maintain a tin price at which non-participating producing countries can sell any quantities available in excess of their own requirements of the metal. While it is impossible to estimate the amount of the total production of the Sino-Soviet Bloc surplus to their internal consumption, recent events indicate that it is substantial and the future of the International Tin Agreement will depend on whether satisfactory and reliable arrangements can be established and maintained for the control of exports from the Bloc.

Apart from this important consideration, and provided economic recovery in the United States continues uninterruptedly, there should be some improvement in demand from that country in the current year, and there have recently been increased purchases by other consuming countries. In my view, however, it will be necessary for the proper functioning of the International Tin Agreement for all the Special Fund tin, and an appreciable portion of the metal in the Buffer Stock, to be liquidated, before any large increase in the total permissible exportable amounts of the signatory producing countries would be justified.

Possible Resumption of Dividends

With the future of the International Tin Agreement dependent on the factors to which I have referred, it is difficult to forecast the earning capacity of the Company for the current year. However, with the No. 6 Dredge now capable of producing considerably in excess of the Company's permissible sales at the current rate of quota, the Company's position is much more satisfactory than it was a year ago, and it should be possible to give favourable consideration to the resumption of dividends at the end of this year, provided there is no setback in the tin price or quota position.

The report and accounts were adopted.



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West African Gold Production for October—December, 1958

Company	October—December 1958			Current Financial Year Total to date			Last Financial Year Total to date			
	Tons (000)	Yield (oz.)	Profit (£000)	Months since year end	Tons (000)	Yield (oz.)	Profit (£000)	Tons (000)	Yield (oz.)	Profit (£000)
Amal Banket	184.9	43,628	108.7	3	184.9	43,628	108.7	188.3	41,441	108.0
Ariston	113.9	36,805	122.8	3	113.9	36,805	122.8	123.1	38,565	151.3
Ashanti	100.2	75,550	391.6	3	100.2	75,550	391.6	82.4	62,309	317.9
Bibiani	105.0	21,600	19.3	3	105.0	21,600	19.3	90.0	19,500	22.7
Bremang*	2332.3	14,073	59.3	12	9778.3	55,759	252.4	8,130.5	41,505	144.0
Ghana M.R.	34.9	13,115	42.6	6	68.9	25,594	78.7	69.3	24,164	79.7
Konongo	19.0	11,401	36.7	3	19.0	11,401	36.7	15.3	11,770	45.3

* Cu. yds. dredged.

South African and Rhodesian Coal Output for October—December, 1958

Company	3 months to December 31 (in tons)	Months since year end	Cumulative Totals (in tons)	
			This year to date	Last year to date
Amal. Coll. of S.A.	1,724,329	12	6,839,572	6,407,759
Apex	248,529	12	882,414	872,043
Blesbok	149,172	12	612,665	622,449
Coalbrook	629,578	12	2,533,045	2,184,024
Coronation	327,037	12	1,288,767	1,207,589
Natal Navigation	340,041	6	677,963	1,633,606
New Clydesdale	282,434	6	540,298	589,305
New Largo	312,670	12	1,298,207	1,221,692
S.A. Coal Estates	451,560	6	913,773	839,327
Springbok	360,694	12	1,341,038	974,500
Transvaal & Delagoa	408,924	4	546,378	477,624
Van Dyks Drift	178,123	12	671,037	674,866
Vierklein	394,035	12	1,489,179	1,370,057
Vryheid Cor.	164,618	12	644,459	636,475
Vryheid Cor.*	121,932	12	491,792	491,974
Wankie	811,770	4	1,086,506	1,344,312
Wankie	47,713	4	64,392	84,312
Witbank	426,395	12	1,671,630	1,685,570

* Coke.



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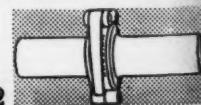
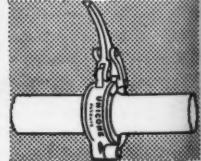
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